GP215/GP200

SERVICE MANUAL

REVISION 0

Canon

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INTRODUCTION

This Service Manual provides basic facts and figures needed to service the GP215/GP200 in the field. The GP215/GP200 is designed to accommodate fax and printer functions in addition to copier functions, and separate service manuals are available for each function; refer to the appropriate service manual as necessary.

This Service Manual is organized as follows:

CHAPTER 1, "General Introduction," shows the GP215/GP200's features, specifications, and step-by-step instructions on how to operate the copier.

CHAPTER 2, "Copying Processes," shows how the GP215/GP200 generates copies while discussing each of the steps involved.

CHAPTER 3, "Operations and Timing," explains the GP215/GP200's mechanical system by function and principles behind its electrical systems in relation to timing of each operation.

CHAPTER 4, "Mechanical System," explains how to disassemble/assemble and adjust the GP215/GP200.

CHAPTER 5, "Installation," provides points to note when selecting the site of installation and instructions on how to install the GP215/GP200.

CHAPTER 6, "Maintenance and Inspection," provides tables of periodically replaced parts and consumables/durables as well as a scheduled servicing chart.

APPENDIX contains a general timing chart, general circuit diagrams, and PCB diagrams.

This Service Manual is accompanied by the Service Handbook, which contains information on how to maintain and inspect the GP215/GP200 through adjustment and troubleshooting work.

Information found in this manual may be updated from time to time for product improvement, and major updates are communicated in the form of Service Information bulletins.

All service persons are expected to be thoroughly familiar with the contents of this Service Manual, the Service Handbook, and Service Information bulletins and be ready to respond to the needs of the user promptly.

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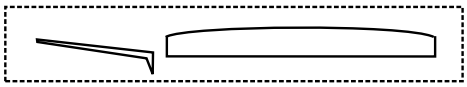
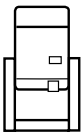
■ System Configuration

The GP200/GP215 Series machine may be configured as follows:

ADF-F1 (comes standard with some models)

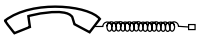


Projector



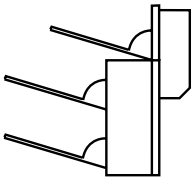
RDF-G1 (comes standard with some models)

GP215F (w/ fax function)
GP215 (w/o fax function)
GP200F (w/ fax function, w/o duplexing function)
GP200 (w/o fax function, w/o duplexing function)

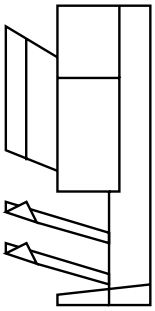


Handset

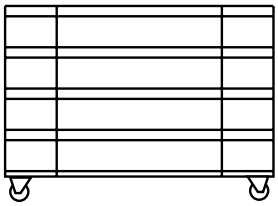
Multi-Output Tray-C1



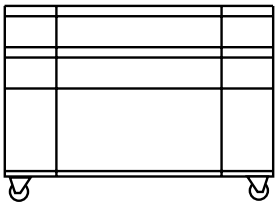
Multi-Output Tray-B2



Cassette Feeding Unit-L1



Cassette Feeding Unit-M1



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CHAPTER 1

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I. FEATURES

1. **Establishes a new set of standards for "high-quality imaging" at a resolution of 1200 × 600 dpi (equivalent), which is the world's first.**
   - **In copier mode, the resolution is 600 × 600 dpi when reading and 1200 × 600 dpi when writing.**
   - **In fax reception mode, the resolution is 600 × 600 dpi (hyper genesis smoothing).**
   - **In printer mode, the resolution is 1200 × 600 dpi (new super smoothing technology).**
2. **Ease of operation and productivity from an integrated design.**
   - **The display is a large LCD touch panel for clear viewing and simple operation. (The display intensity may be varied.)**
   - **The on-going fax communication status may be indicated while in copier mode. The display indicates the status (reception/transmission) job number, fax number, party number, and number of processing pages at intervals of 1 sec.**
3. **Power-saving, space saving, and ozone-less considerations for the office and the environment.**
   - **The on-demand fixing method warms up the machine quickly so that sleep mode may be made use of without the risk of wasting time.**
   - **The wait time is 8 sec or less. (at power-on on the control panel; 8.6 sec or less if the main switch is used)**
   - **The machine is appreciably quieter than the existing models for a better office environment.**
   - **With the help of its power-saving design, the power consumption is 4 W or less* in sleep mode (about 1/25 of existing Canon models) and 57 W or less** in standby (about 1/4 of existing Canon models).**
   - **The roller charging method has enabled ozone-less operation.**
   - **The width is only 58.5 cm. With the MDC function built into the machine, more space is saved. All additional copier, fax, printer, and network functions may be built into the machine without affecting the machine size.**
4. **GP215 Series with duplexing functions**
   - **As many as four models are available—with combinations of copier, copier/fax, and copier/printer.**
   - **The copier/fax model comes standard with an ADF-F1 or an RDF-G1.**

	Copier	Fax	Printer	Duplexing	Copyboard
GP215	◎	○	○	◎	△
GP215F ADF (GP215FA)	◎	◎	○	◎	◎ ADF-F1
GP215F RF (GP215FR)	◎	◎	○	◎	◎ RF-G1

◎: Standard ○: Option △: Either copyboard cover, ADF-F1, or RDF-G1. (as an option, PostScript Level 2).

* Sleep state is when the main power is OFF. Fax reception is possible. (Not 4 W if a fax transmission reservation has been made or the printer function has been added.)

** Standby state is when the main power is on. In copier/fax mode, 57 W or less. In copier mode, 50 W or less.

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II. SPECIFICATIONS

1. Type

Item	Specifications
Body	Desktop
Copyboard	Fixed
Light source	Fluorescent lamp
Lens	Lens array
Photosensitive medium	OPC

2. System

Item		Specifications
Copying		Indirect electrophotographic
Charging		AC roller charging
Exposure		Spot laser
Copy density adjustment		Automatic or manual
Development		Dry, single component toner projection
Pick-up	Automatic	2 cassettes
	Manual	Multifeeder (about 5 mm deep)
Transfer		Roller charging
Separation		Static (static eliminator) + curvature
cleaning		Blade
Fixing		SURF

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3. Performance

			120V	230V
Types of originals			Sheet, book, 3-D object (2 kg max.)	
Maximum size of original			A3, (11 × 17) max.	
Reproduction ratio	Direct		1:1±0.5%	
	Reduce I		1:0.250	
	Reduce II		1:0.500	
	Reduce III		1:0.647	–
	Reduce IV		1:0.737	–
	Reduce V		1:0.786	–
	Enlarge I		1:1.214	1:1.414
	Enlarge II		1:1.294	–
	Enlarge III		1:2.000	
	Enlarge IV		1:4.000	–
	Enlarge V		1:8.000	–
	Zoom		1: 0.250 to 8.000 (25% to 800%, in 1% increments)	
Wait time			• 8.6 sec or less (20°C) from main power-on to start of copying • 7.9 sec or less from control panel power-on (sleep) to start of copying (fax model)	
First copy			GP215: 9.2 sec or less (shortest mode)	
Continuous copying			100 copies	
Copy size	Cassette pick-up		A3 (297 × 420 mm; max.) / 11”×17” (279×432mm:max) A5 (STMT; min.)	
	Multifeeder		A3 (297 × 431.8 mm; max.) / 11”×17” (279×432mm:max) Postcard (A6 vertical)	
Paper source			500 sheets in each cassette, 50 sheets in multifeeder (80 g/m^2 paper)	
Types of copy paper	Cassette		Plain paper (64 to 80 g/m^2), tracing paper (SM1, GNT80**), colored paper*, recycled paper (64 to 80 g/m^2), envelope (COM10, Monarch, DL, C5, B5, No. 4)	
	Multifeeder		Plain paper (64 to 128 g/m^2), tracing paper (GNT80**), transparency*, postcard, label sheet, recycled paper (64 to 80 g/m^2), envelope	
	Two-sided/ overlay copying	Automatic Multi-feeder	Plain paper (64 to 80 g/m^2)	
			Plain paper (64 to 128 g/m^2) (no overlay copying)	

*Canon recommended paper.
*May be used but may not feed as expected.

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Cassette	Claw	Non
	Regular/universal	55 mm (max.) stacking height (about 500 sheets of 80 g/m^2 paper)
Multifeeder tray		50 sheets (80 g/m^2)
Delivery tray		100 sheets (approx.; 80 g/m^2)
Non-image width	Leading/trailing edge	2.5 mm in Direct
	Left/right	2.5 mm in Direct
Auto clear		Provided
Auto shut-off		Provided (2-min standard, may be varied between 0 an 9 min in 1-min increments)
Option	Feeder	ADF·F1 RF·G1
	Sorter	Multi-Output Tray -C1 Multi-Output Tray -B2
	Pedestal	Cassette Feeding Unitl-L1 Cassette Feeding Unitl-M1
	Others	Handset-A1 Control Card V Film Projector

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4. Others

<table>
<tr><td rowspan="3">Operating environment</td><td>Temperature</td><td>7.5° to 32.5°C</td></tr>
<tr><td>Humidity</td><td>5% to 85%</td></tr>
<tr><td>Atmospheric pressure</td><td>0.8 to 1.0 atm</td></tr>
<tr><td rowspan="3">Power supply</td><td rowspan="2">120 V</td><td>Serial number</td></tr>
<tr><td>GP200: NFY xxxx
GP200F:NFZ xxxx</td></tr>
<tr><td>220 / 240V</td><td>GP215:UBY xxxx, QFY xxxx, SFY xxxx, TFY xxxx, UFY xxxx.
GP215F:UBZ xxxx, QFZ xxxx, SFZ xxxx, TFZ xxxx, UFZ xxxx.</td></tr>
<tr><td rowspan="4">Power consumption</td><td>Maximum</td><td>1.5 kW or less</td></tr>
<tr><td>Standby</td><td>0.080 kWh (reference only)</td></tr>
<tr><td>Continuous copying</td><td>0.750 kWh (reference only)</td></tr>
<tr><td>Quick start mode (SLEEP 1)</td><td>0.045 kWh (reference only)</td></tr>
<tr><td></td><td>Power saving mode (SLEEP 2)</td><td>0.003 kWh (reference only)</td></tr>
<tr><td rowspan="2">Noise</td><td>Copying</td><td>66 dB or less (sound power level)</td></tr>
<tr><td>Standby</td><td>40 dB or less (sound power level)</td></tr>
<tr><td colspan="2">Ozone</td><td>0.01 ppm or less (average); 0.02 ppm or less (max.)</td></tr>
<tr><td rowspan="3">Dimensions</td><td>Width</td><td>585 mm (pedestal, copyboard cover)</td></tr>
<tr><td>Depth</td><td>700 mm (pedestal, ADF)</td></tr>
<tr><td>Height</td><td>571 mm (pedestal, RDF)</td></tr>
<tr><td colspan="2">Weight</td><td><table><tr><th></th><th>GP215</th></tr><tr><td>Body only
(w/ copyboard cover)</td><td>72.4kg</td></tr><tr><td>w/ ADV</td><td>77.1kg</td></tr><tr><td>w/ RDF</td><td>84.7kg</td></tr></table></td></tr>
<tr><td>Consumables</td><td>Copy paper Toner</td><td>Keep copy paper wrapped to protect against humidity.</td></tr>
</table>

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5. Copying Speed

Reproduction ratio		Size	Copy paper size	Copies/min
Direct		A3 (297 × 420mm) A4 (210 × 297mm) A4R (297 × 210mm) A5 (148.5 × 210mm) A5R (210 × 148.5mm) B4 (267 × 364mm) B5 (182 × 257mm) B5R (257 × 182mm)	A3 A4 A4R A5 A5R B4 B5 B5R	12 21 16 22 22 13 22 18
Reduce	II	A3 → A5	A5R	20
	III	A3 → B5	B5R	18
	IV	A3 → A4 B4 → B5	A4R B5R	15 18
	V	B4 → A4 B5 → A5	A4R A5	16 22
	VI	A3 → B4 A5 → B5	B4 B5	13 22
Enlarge	II	A5 → A3	A3	12
	III	A4 → A3 B5 → B4	A3 B4	12 14
	IV	A4 → B4 A5 → B5	B4 B5	14 22
	V	B4 → A3 B5 → B4	A3 B4	12 14

Table 1-201 Copying Speed (copier only)

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Ratio	Size	Copies/min
DIRECT	LTR	20
	11×17	11
	LGL	14
	LTRR	17
	STMT	22
	STMT-R	20
REDUCE	LGL → LTRR	17
	11×17 → LGL	15
	11×17 → LTRR	16
	11×17 →STMTR	19
	11×15 → LTRR	16
ENLARGE	LGL → 11×17	12
	LTR·R → 11×17	12
	STMTR → 11×17	12

Table 1-202 Copying Speed (copier only)

Specifications subject to change for product improvement.

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III. NAMES OF PARTS

A. External View

- Model with RDF-G1 as Standard

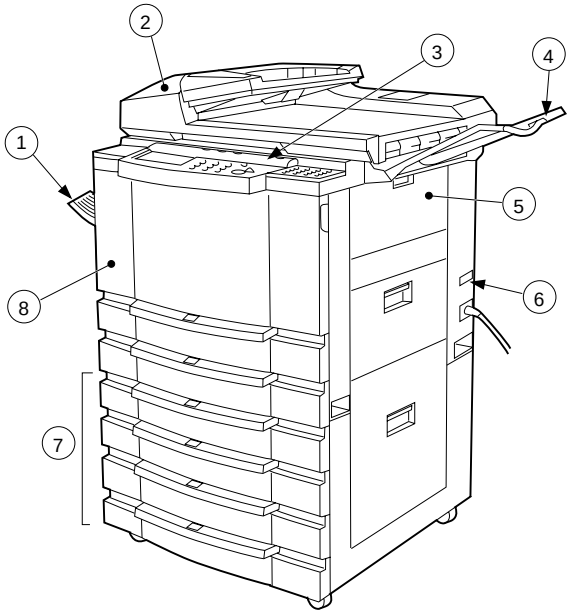

Figure 1-301

① Deliery tray
② RDF-G1
③ Control panel power switch
④ Original delivery tray (for RDF)
⑤ Multifeeder

- Model with ADF-F1 as Standard

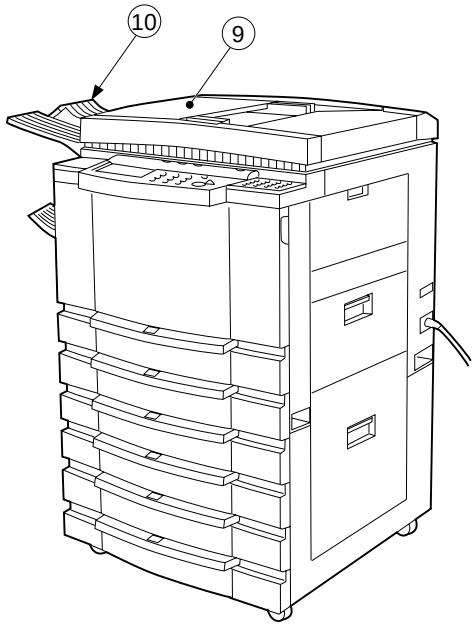

Figure 1-302

⑥ Main power switch
⑦ Cassette Feeding Unit-L1 (option)
⑧ Front door
⑨ ADF-F1
⑩ Original delivery tray (for ADF)

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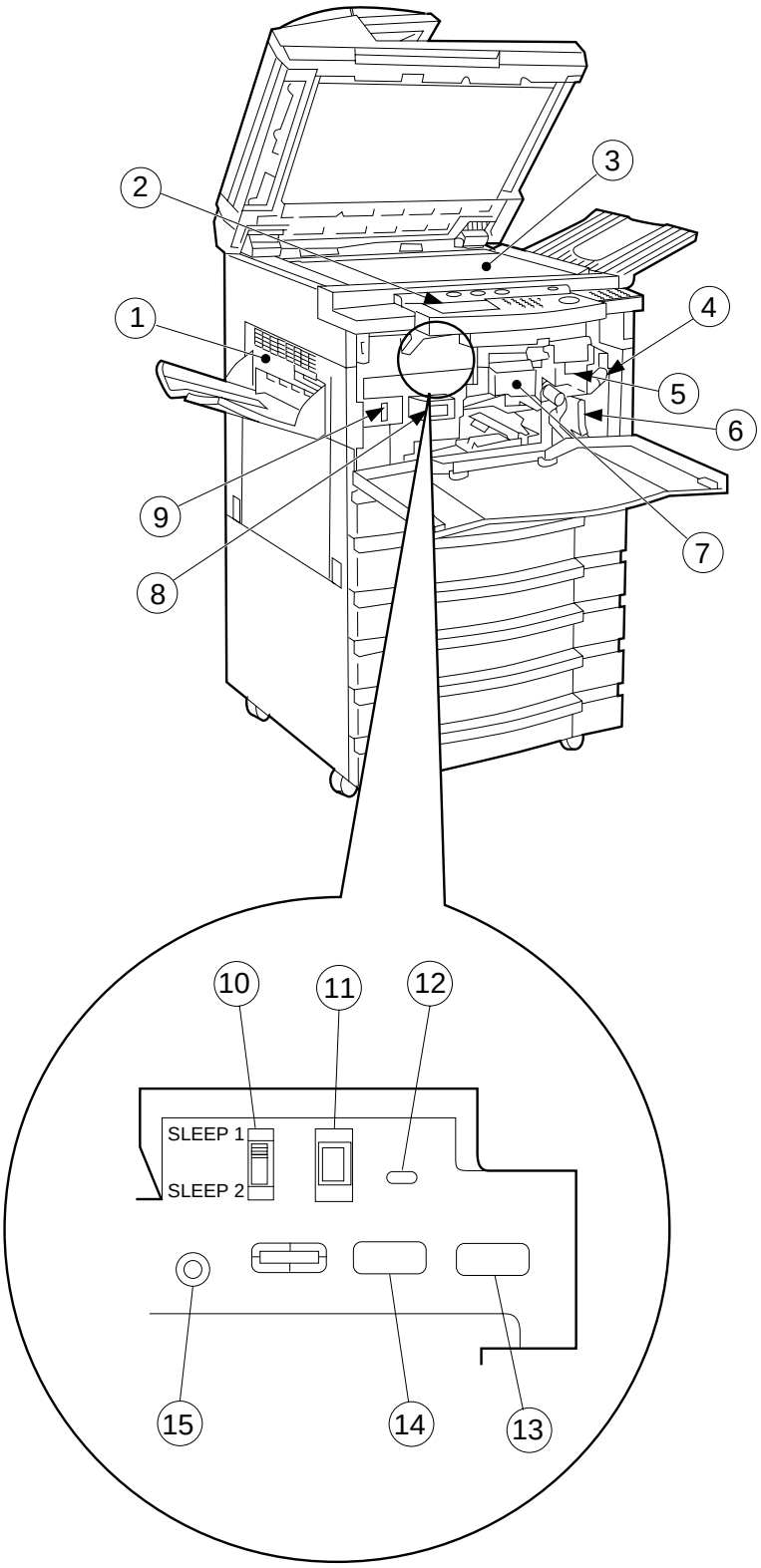

① Delivery door
② Control panel
③ Copyboard glass
④ Developing assembly releasing lever
⑤ Developing assembly
⑥ Feeding assembly releasing lever
⑦ Drum unit
⑧ Fixing assembly releasing lever opening
⑨ Door switch assembly
⑩ Power saving mode switch
- SLEEP 1 (top):
  Quick start mode
  Anti-condensation function ON
- SLEEP 2 (bottom):
  Power saving mode
  Anti-condensation function OFF

⑪ Cassette heater (option) switch
⑫ Service switch
⑬ Counter (total)
⑭ Counter (printer)
⑮ LCD display contrast adjustment

Figure 1-303

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B. Cross Section

1. Cross Section of the GP215

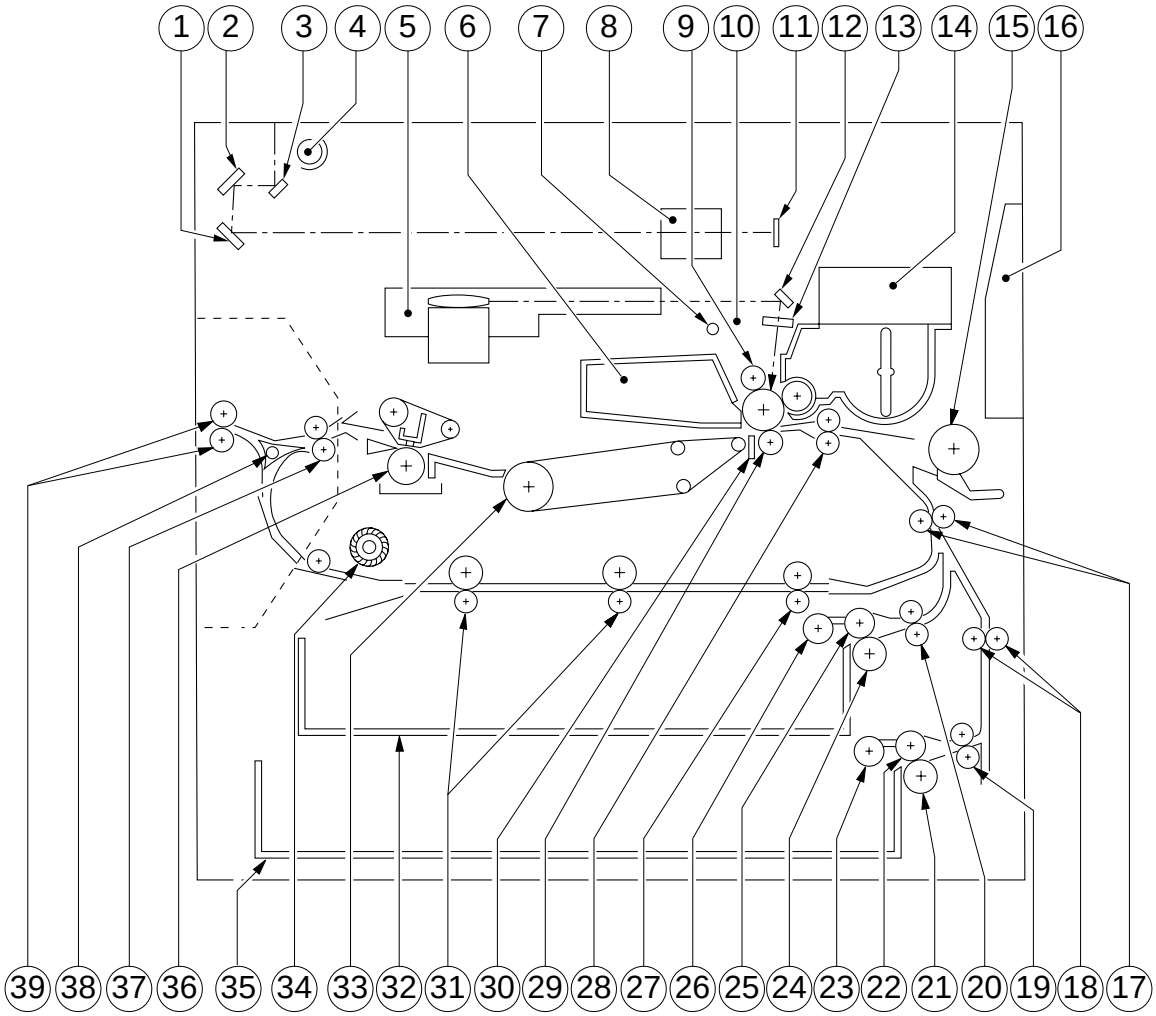

Figure 1-304

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① No. 3 mirror
② No. 2 mirror
③ No. 1 mirror
④ Scanning lamp (fluorescent lamp)
⑤ Laser unit
⑥ Drum cleaner assembly
⑦ Pre-exposure lamp
⑧ Lens
⑨ Primary charging roller
⑩ Drum unit
⑪ CCD
⑫ Laser mirror
⑬ Dust-proofing glass
⑭ Developing assembly
⑮ Multifeeder pick-up roller
⑯ Multifeeder tray
⑰ Vertical path roller 1
⑱ Vertical path roller 2
⑲ Cassette pick-up feeding (lower)
⑳ Cassette pick-up feeding (upper)
㉑ Cassette 2 separation roller
㉒ Cassette 2 feeding roller
㉓ Cassette 2 pick-up roller
㉔ Cassette 1 separation roller
㉕ Cassette 1 feeding roller
㉖ Cassette 1 pick-up roller
㉗ Lower feeding assembly outlet roller
㉘ Registration roller
㉙ Transfer roller
㉚ Separation static eliminator
㉛ Set-back roller
㉜ cassette 1
㉝ Feeding assembly
㉞ Fan
㉟ Cassette 2
㊱ Fixing assembly
㊲ Delivery roller 1
㊳ Paper deflecting plate
㊴ Delivery roller 2

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C. Arrangement of Extension Boards

1. Arrangement

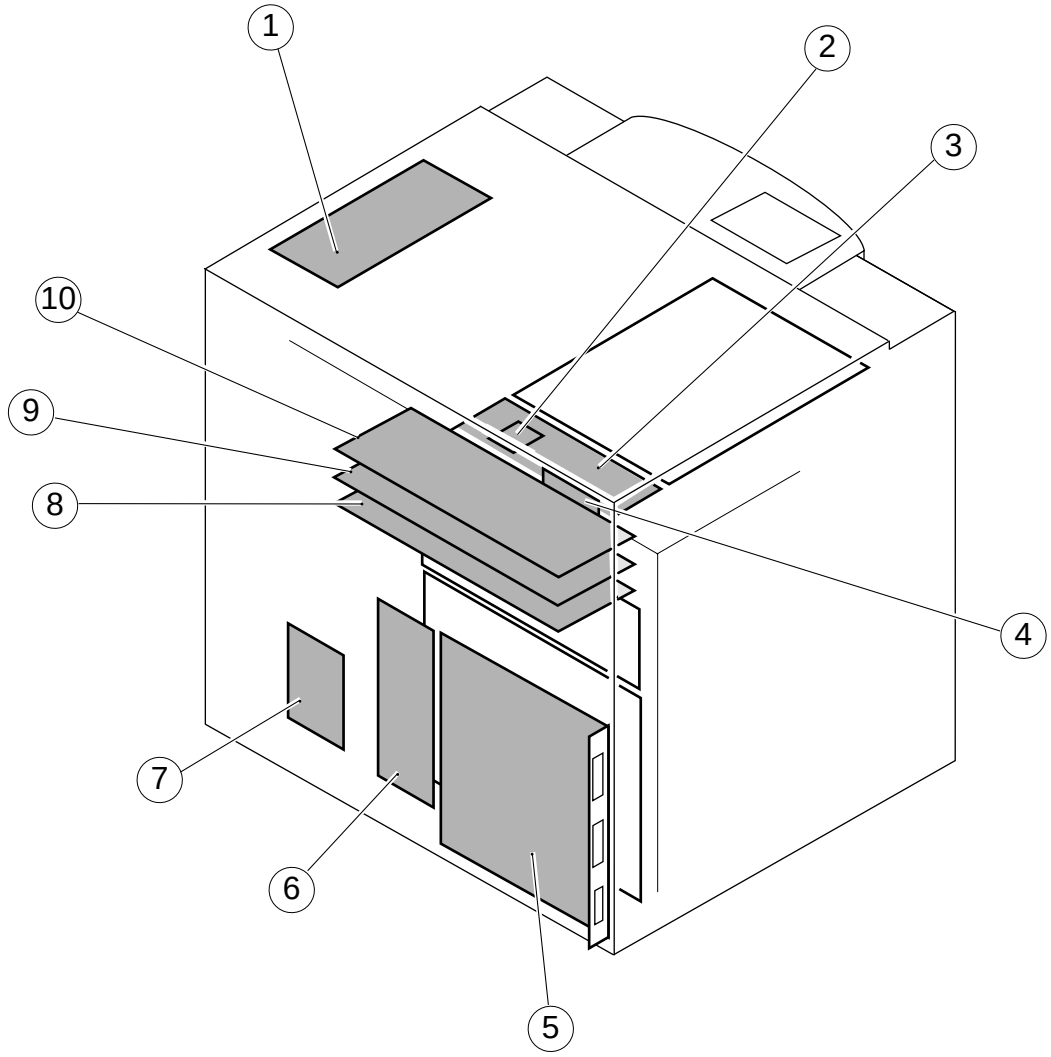

Figure 1-306

① SCSI Board
② CIST Board
③ CORE/IP Board
④ FAX Motherboard
⑤ Printer board
⑥ System Motherboard
⑦ System Power Supply
⑧ Protocol Controller Board
⑨ Network Interface Board
⑩ G3FAX board

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IV. OPERATION

A. Turning On the Power Switches

The machine offers two power switches: main power switch and control panel power switch.

You must first turn on the main power switch and then the control panel switch whenever you are turning on both switches.

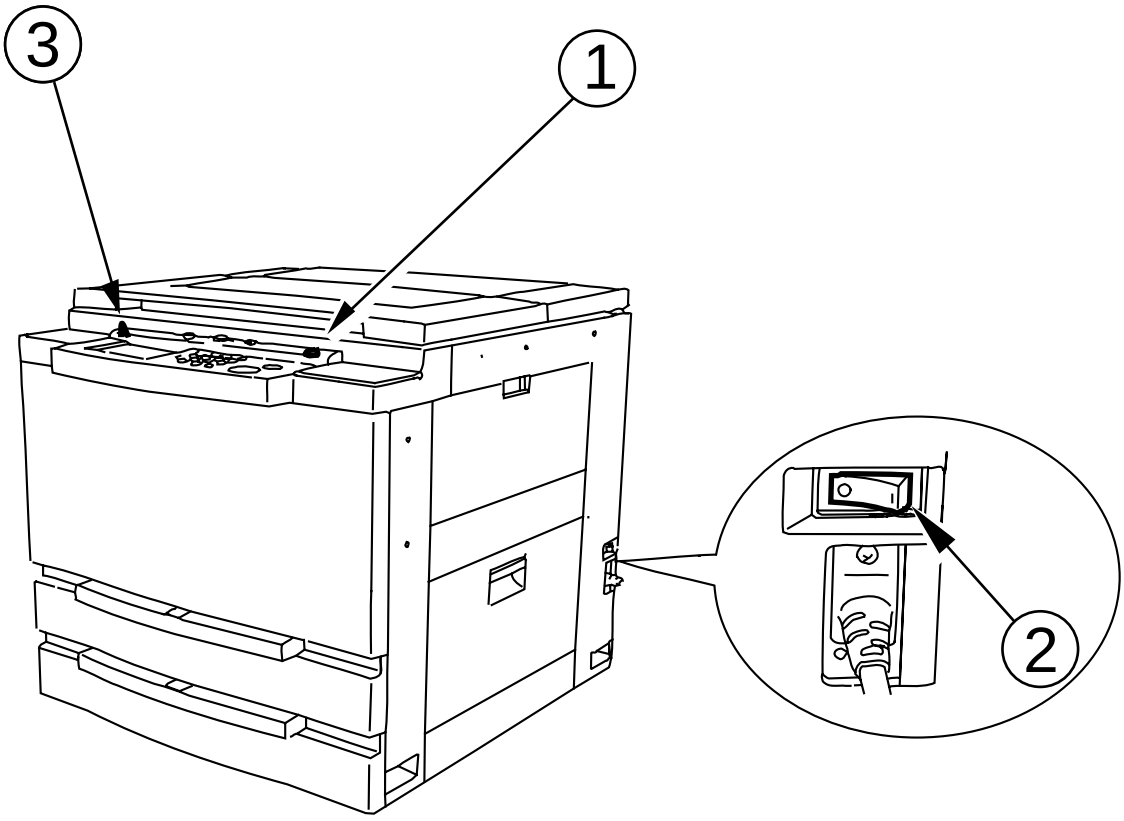

Figure 1-401

① Control panel power switch
② Main power switch
③ Main power supply lamp

B. Control Panel

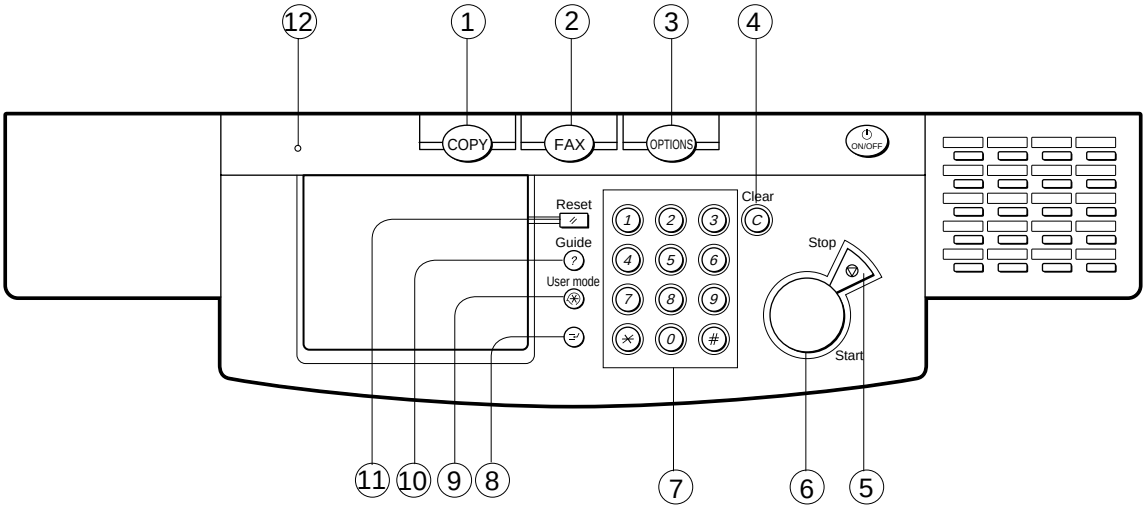

Figure 1-402

① Copier key
② Fax key
③ Extension key*
④ Clean key
⑤ Stop key
⑥ Start key

***If for North America, 'PRINT I/F'.**

⑦ Keypad
⑧ Interrupt key
⑨ User mode key
⑩ Guide key
⑪ Reset key
⑫ Power supply lamp

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■ Function Basic Screen of the Touch Panel

1. Copier Basic Screen

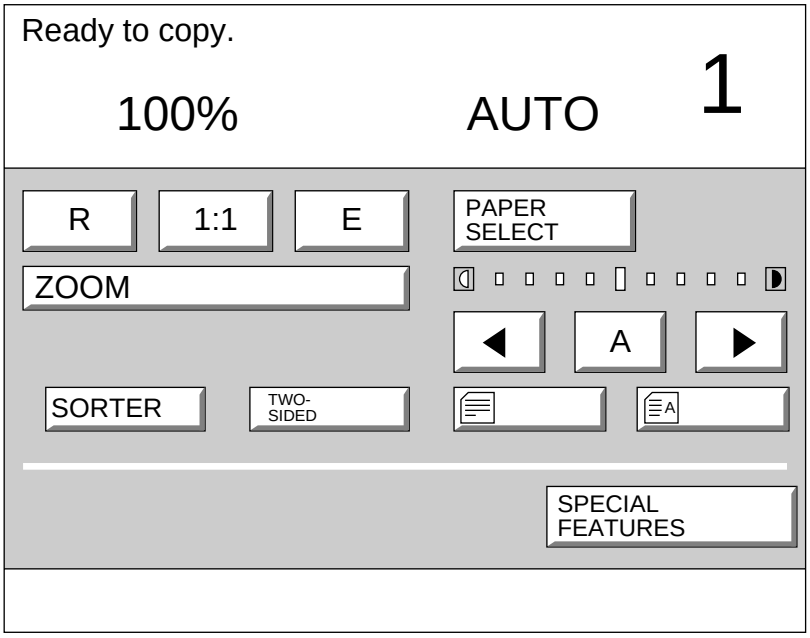

Figure 1-403

2. Fax Basic screen

- Press the Fax key to open this screen.

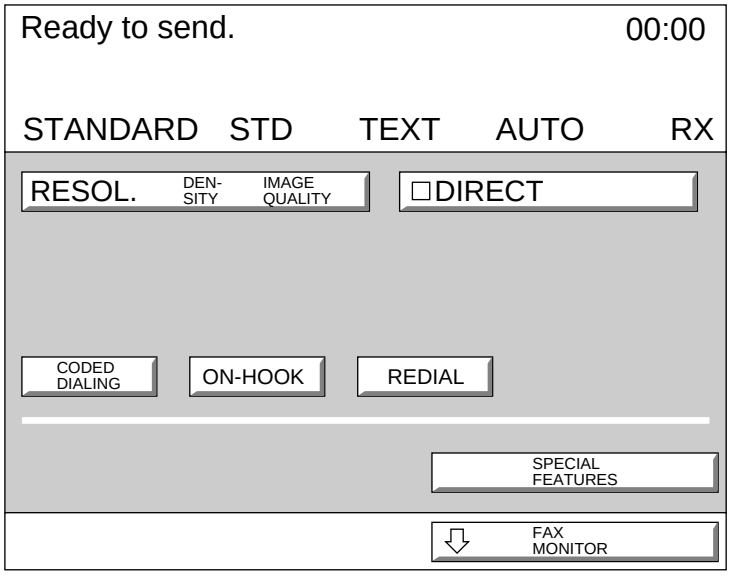

Figure 1-404

Note:
For details, see the Fax Service Manual.

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C. Basic Operation

1. Functions Keys

Of the keys on the screen, you may select any of the following on the screen:

R .....120V:78, 73, 64, 50, 25 (%)
230V:50, 25 (%)

E .....120V: 121, 129, 200, 400, 800 (%)
230V:141, 200 (%)

Zoom .....Ratio display, Auto Zoom, +/–, Entire Image, XY Zoom, Zoom Program, Multi-page Enlarge

SORTER .....Sort, Staple Sort, Group (only if sorting unit is installed)

PAPER SELECT .....Auto paper selection, stack bypass, cassette

SPECIAL FEATURES REC., Transp. INTERLVING, SHIFT, MAREGIN, FRAME ERASE, TWO-PAGE SEPARATION, MODE ,MEMORY, SHARPNESS, IMAGE CREATION, AREA DESIG., IMAGE COMB., IMAGE SEPARATION, SHEET OVERLAY, DIF. SIZE ORIGINAL

Note:

1. No next screen exists for Direct, A, text, or text/photo.
2. Using the Preference key, the most frequently used modes may be selected for display. To select, use ‘custom copy setting’ in user mode.
3. The DEF. SIZE ORIGINAL key is effective only when an RDF is installed.

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2. Operations Available during Copying

① Stopping Copying
To stop continuous copying, press the Stop key or the Reset key . Copying will stop after completing the ongoing copying run.

② Switching from AE Mode to Manual density Control Mode
You may switch from AE (auto density control) mode to manual density adjustment mode during continuous copying.
However, you cannot switch from manual density adjustment mode during continuous copying.

③ Interrupting On-Going Copying
To make copies of a different original, press the Interrupt key to stop the on-going copying.

Note:
The following keys are effective during continuous copying:
a. Stop key
b. Reset key
c. Interrupt key
d. Copy Density key (from AE to manual)

3. Interrupting On-Going Copying

If you want to make copies of a different original while making a large number of copies in continuous copying mode, you can suspend the ongoing copying operation temporarily.

Or, you can suspend fax reception or printer operation to make copies. (Fax reception or printer operation will resume as soon as you end interrupt mode.)

1) Press the Interrupt key to select interrupt mode.
   Available Operations
   - Making one-sided copies
   - Making 1 to 100 copies
   - Selecting non-sort mode
   - Selecting manual feed mode
   - Selecting a density (darker, lighter, AE)
   - Selecting a reproduction ratio (may be auto)
   - Selecting a cassette
   - De-selecting ID mode
   - De-selecting interrupt mode

   You cannot use the document feeder for interrupt mode.
2) Place the original, and press the Start key.
3) To end interrupt mode, press the Interrupt mode once again.

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4. Making Two-Sided Copies or Overlay Copies

Using manual feeding mode, you can make two-sided copies overlay copies.

Be sure to keep the following in mind when making two-sided or overlay copying mode:

① Make sure that the side copied and the side to be copied have the same orientation (i.e., do not reverse rear and front) when turning over the copy paper.
② Make sure that the copy paper is not moist.
③ Make sure that the copy is not curled.
④ After the first copying run, cool the copy paper sufficiently and remove the curling before starting the second copying run.
⑤ Use 64 to 128 g/m^2 paper.
⑥ Remove the curling before the second copying run for a post card or thick paper (128 g/m^2).

5. Using ID Mode

In ID mode, you must enter a 4-digit ID number to make copies. As many as 100 ID numbers may be stored, and you can check the count (number of copies made) by number for control of copying volume by group.

a. Setting the System Control Password

1) Select 'user mpde', 'custom common settings', and then 'system settings password setting' to set the system control password.

b. Storing ID Numbers

1) Set the system control password.
2) Select 'custom common settings' and 'DEPT. ID MANAGEMENT' to enter the system control password.
3) Select 'yes' to 'DEPT. ID MANAGEMENT', and store the appropriate group ID and ID number for 'STORE DEPT. ID PASSWORD'.

c. Entering an ID Number

1) Press the 'ID' icon in the upper right corner of the Basic screen.
2) Enter the appropriate 'ID' and 'password'.

d. Cleaning the Count (all ID numbers)

1) Select 'user mode', 'custom common settings', and then 'DEPT. ID MANAGEMENT' to enter the system control password.
2) On the 'DEPT. ID MANAGEMENT' screen select 'ON' and then 'COPY TOTALS'; then, press 'CLEAR ALL TOTALS'.

Note:
You cannot clear the counts individually.

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D. Extension Mode

■ **Extension Mode Panel (initial screen)**

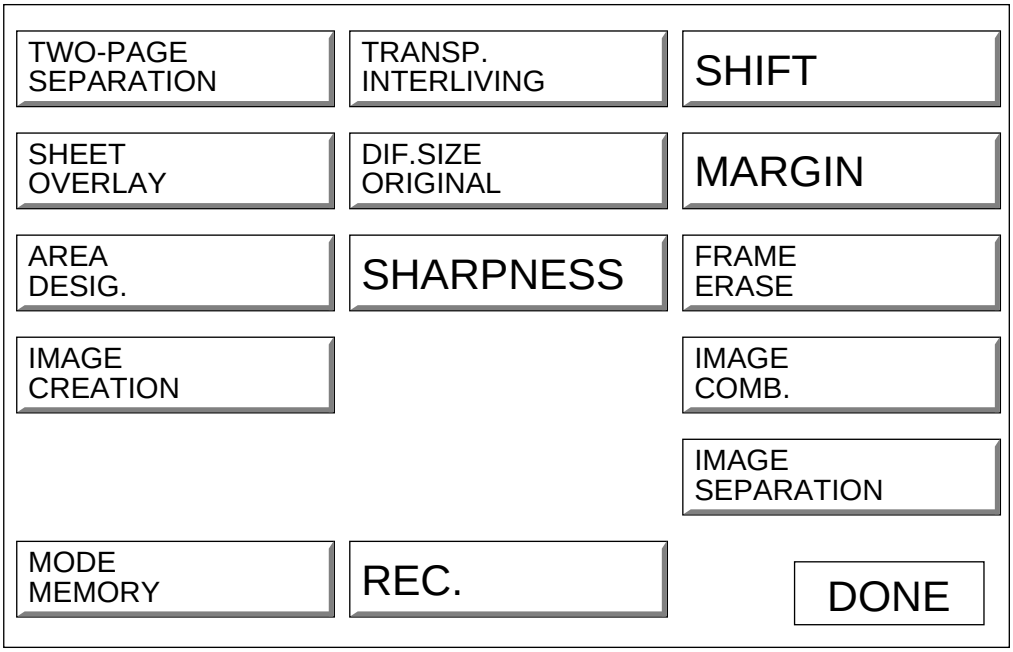

Figure 1-405

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■ SPECIAL FEATURES Screen

SPECIAL FEATURES screen	Next screen	Remarks
TWO-PAGE SEPARATION		
TRANSP. INTERLVING	Stack bypass Select	A4, A4R, LTR, LTRR
SHIFT	Center Shift, Corner Shift (8 directions), Keypad Setting	
SHEET OVERLAY	SHEET OVERLAY BOOK OVERLAY	Requires a duplexing unit.
DIF. SIZE ORIGINAL/ THIN SHEET ORIGINAL		Requires an RDF for original mix size mode and an ADF for thin paper originals.
MARGIN	Left margin, Right margin, Top margin, Bottom margin	
AREA DESIG.	Area Desig. (editor or keypad), Framing, Blanking, Negative/Positive Reversal	
SHARPNESS	Soft to Hard (9 steps)	
FRAME ERASE	Sheet Frame Erasing, Original Frame Erasing, Book Frame Erase, Binding Erase	
IMAGE CREATION	Mirror Image, Image Repeat, Negative/Positive Reversal, Slant image.	
IMAGE COMB.	2-on-1, 4-on-1, 2-on-1 Two-Sided	Requires an RDF.
PROJECTOR	35mm Negative, 35mm Positive, 4 × 5 Negative, 4 × 5 Positive	Requires a projector.
IMAGE SEPARATION	1-on-2, 1-on-4, 1-on-2 / One-sided, 1-on-4 / One-Sided	Requires an RDF.
MODE MEMORY	M1 through M5	
REC.	Most Recent, 2nd Most Recent, 3rd Most Recent	

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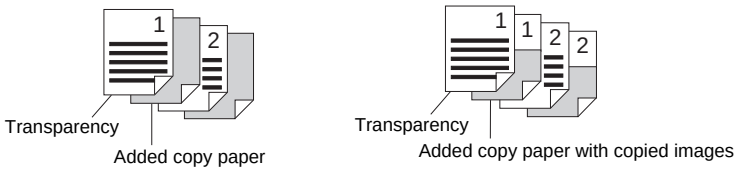
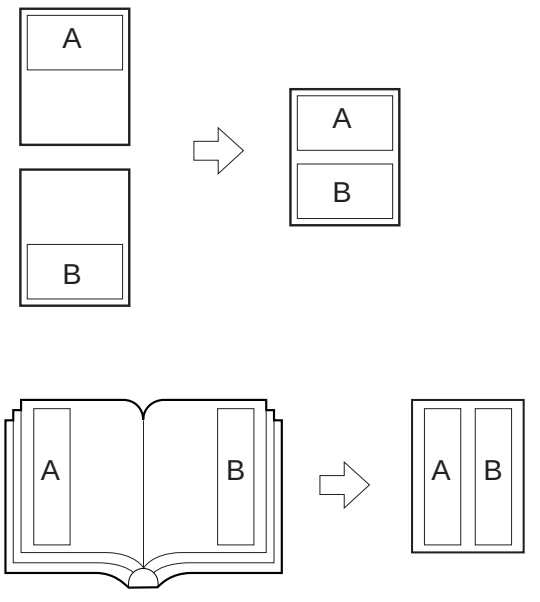
1. Functions

Key	Description
SPECIAL FEATURES	———
Page Separation	You can copy both left and right pages of an open original (book) on separate sheets by a single operation (on a single page basis).
Transparency Interleaf	You can add copy paper between transparencies when copying on transparencies. Set the transparencies in the multifeeder. (Or, you may use a feeder). ① Adding Copy Paper ② Copying on Copy Paper 
Shift	You can shift the position of the original anywhere for copying. For corner shift, you may select one from eight directions.
Center Shift	
Corner Shift	
Keypad Shift	
Overlay	You can lay two images on the same side of a single sheet of copy paper in any of three ways: • Making an overlay copy from two one-sided ordinals. • Making an overlay copy from an open original (book). 
SHEET Overlay	
Book Overlay	

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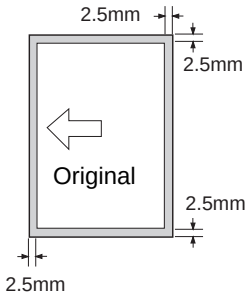
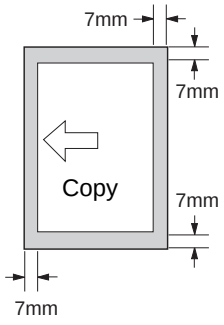
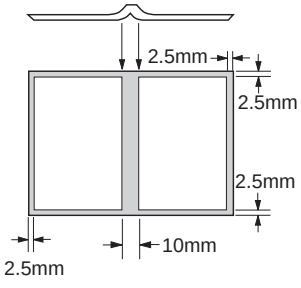
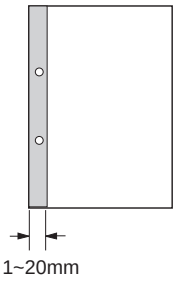
Key	Description
SPECIAL FEATURES	———
DIF. Size Original	You can use originals of different sizes using a feeder. (The originals may be of different lengths but must be of the same feeding width.)
Thin Sheet Original	You may use an ADF when copying thin originals (invoice slips, etc.; 35 to 50 g/m^2 or less).
Margin Left Margin Right Margin Top Margin Bottom Margin	• You may move an image to the front or the rear in sub scanning direction by specifying a distance so as to create a margin on the left/right of the output. • The binding width may be adjusted between 1 and 20 mm in 1mm increments. • You may select cover only, back only, or both cover and back.
Area Desig. Framing Blanking Negative/Positive Reversal	You can select an area in a specific image for special processing. The X coordinate must be 432 mm or less and Y, 297 mm or less.
Sharpness	You can emphasize or subdue images. You may select one from nine different degrees. Select 'hard' for crisp characters and lines or 'soft' for photos.
Frame Erase Sheet Frame Erase Original Frame Erase Book Frame Erase Binding Erase	You can select from among the following four types of frame erasing: ① Original Frame Erase  ② Sheet Frame Erase  ③ Book Frame Erase  ④ Binding Erase 

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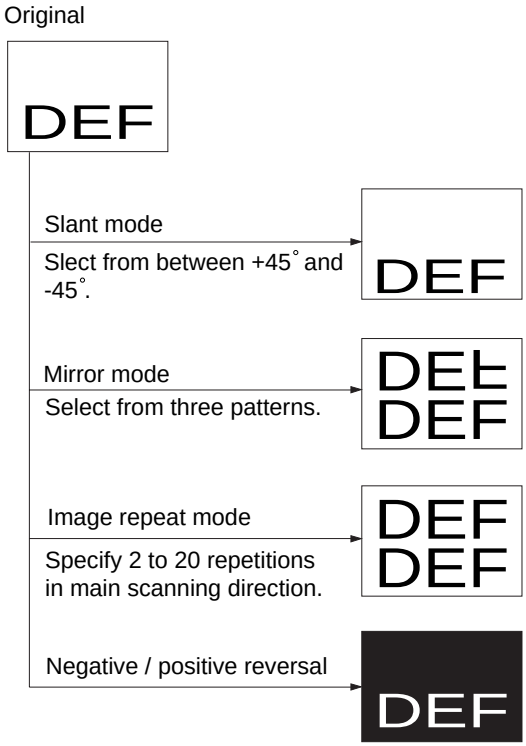
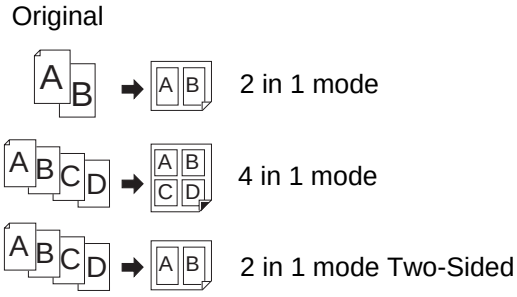
Key	Description
SPECIAL FEATURES	———
Image Creation Mirror Image Image Repeat Negative/Positive Reversal Slant Image	You can select any of the following modes after pressing the Image Create key. 
Image Comb. 2-on-1 4-on-1 2-on-1 Two-Sided	You can reduce two or four originals to copy on a single sheet of copy paper. For details, see the Operator's Manual, as the specifics vary depending on the copier model and options configuration. 
Projector 35mm Negative 35mm Negative 4 × 5 Negative 4 × 5 Positive	You can use a film projector to copy photo film, which may be either of four types.

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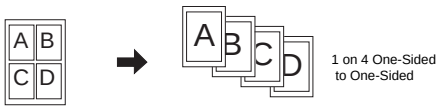
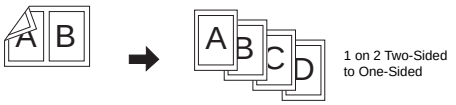
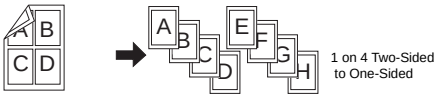
Key	Description
Special Features	————
Separation image	You can divide a single original into several parts for enlargement and copying on one side of several copies.
1-on-2 One-Sided to One-Sided	1-on-2 One-Sided to One-Sided
1-on-4 One-Sided to One-Sided	 1-on-4 One-Sided to One-Sided
1-on-2 Two-Sided to One-Sided	 1-on-2 Two-Sided to One-Sided
1-on-4 Two-Sided to One-Sided	 1-on-4 Two-Sided to One-Sided
Mode Memory	You can store as many as five combinations of any copying modes. In addition, you may store the name of each mode key.
M1 through M5	
REC.	You can recall a copying mode which has been stored previously for use; as many as three modes may be recalled.
Most Recent	
2nd Most Recent	
3rd Most Recent	
User Mode	————
Auto Sort	You can opt for automatic switching to sort mode when an original is placed in the RDF. (This is effective when the Multi Tray 12 and an RDF are installed.
Face Down Output	You can opt for reversed delivery of copies so that the backs of the copies are upward.
Projector	You can opt for displaying the Projector key as part of extension mode.
Photo Mode	You can select the use of photo mode. When 'ON' is selected, the Photo key will be displayed on the Copier Basic screen.
Standard Key 1/2 setting	You can select up to two Preference keys from among the extension mode keys for display on the Copier Basic screen.
Custom Setting Initialize	You can initialize the copier specifications settings to factory defaults.
Standard settings	You can store/initialize the combination of copying modes in response to power-on or a press on the Reset key.
Store	
Init.	

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E. Common Settings

Under custom common settings, you can manage functions available to the user (copier, fax functions, etc.) or execute adjustment and cleaning modes.

Start user mode for custom common settings.

1. Custom Common Settings

No.	Item	Description	Factory settings
1	INITIAL FUNCTION	Use it to select initial functions; i.e., copier or fax functions, in response to power-on.	Copier functions
2	AUTO-CLEAR SETTINGS	Use it to specify whether to return or not to return to the functions selected under 'initial functions' after auto clear. Return: To return to initial function setting mode. Do not return: To return to the mode before auto clear.	Return
3	SYSTEM DIFF SIZE ORIGINAL	Use it to specify whether originals of different feeding widths will be placed in the feeder in non-copier mode. ON: To place originals of mixed sizes but of the same feeding width. OFF: To not to place originals of different sizes.	ON
4	AUTOMATIC EXPOSURE ADJUSTMENT	Use it to select the appropriate automatic density adjustment mode. Priority on Speed: To use text mode for density adjustment. No pre-scanning Priority on Image Quality: To execute pre-scanning to identify image/image quality, text, text/photo mode.	Priority on speed
5	AUDIBLE TONES	Use it to specify whether to sound or not sound the three buzzers (input, alarm, job end). ON: To sound OFF: Not to sound	Input: ON Alarm: ON Job end: ON
6	DRAWER ELIGIBILITY FOR APS/ADS	Use it to select cassette holders/manual feeding tray for auto paper selection and auto cassette selection. ON: To include in auto selection. OFF: To specify inclusion only in manual mode.	Manual: OFF Cassettes 1 through 6: ON

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No.	Item	Description	Factory settings
7	STORE SPECIAL CASSETTE	Use it to select and register the paper appropriate paper sizes and the paper icons for colored paper and recycled paper; 2 each of AB- and Inch-configurations. (default sizes only) You may select up to 16 paper icons.	SPC1: A4 SPC2: A4 SPC3: LTR SPC4: LTR
8	SET ENVELOPE CASSETTE	Use it to register the cassette for envelopes and the type of envelope. As many as six envelope types and two cassette types may be registered.	ENV1: No. 4 ENV2: COM10
9	STACK BYPASS SIZE ENTRY	Use it to specify whether to display the screen for manual feed paper size selection automatically when copy paper is set in the multifeeder assembly. ON: To display the size selection screen. OFF: To not to display the size selection screen.	OFF
10	TRAY.	Use it to specify the use of the Multi Tray 3/12's special tray.	• With Multi Tray-3 Installed, A: Copier B: Fax, printer C: • With Multi-tray 12 Installed A: B: Fax, Printer
11	PRINTING PRIORITY	Use it to specify printing priority for copier, fax, and printer functions.	Copier: 1 Fax: 2 Printer: 3
12	SET SYSTEM SETTINGS PASSWORD	Use it to set the ID number for the System Administrator.	As specified by the user (4-digit number).
13	RESTRICT USE OF FAX WITH CONTROL CARD	Use it to specify whether to limit the individuals permitted to use the fax functions by means of a control card.	No
14	DEPT. ID MANAGEMENT STORE DEPT. ID/PASSWORD COPY TOTALS	Use it to specify whether the function should be controlled by group. You may store/confirm up to 100 groups (group ID and ID numbers).	ID control by group: No ID number registration: No
15	INITIALIZE COMMON CUSTOM SETTINGS	Allows you to return the custom settings to their defaults.	—

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2. Timer Setting

No.	Item	Description	Factory settings
1	DATE/TIME	Use it to set the current date and time.	You may use continuous 4-digit numbers.
2	AUTO SLEEP TIME	Use it to set the time between key operation and start of sleep state by automatically turning off the control panel power switch. 5, 10,20, 30 min; 1 to 8 hr; use service mode (*5*; SHUT_OFF) to turn ON/OFF auto sleep time setting.	5 min
3	AUTO CLEAR TIME	Use it to set the time between key operation and start of the Basic screen automatically. 0: No auto clear 1–9: Set in 1-min increments	2 min
4	TIME UNTIL UNIT QUIETS DOWN	Use it to set the time between copying operation and start of quiet mode. 0–9: Set in 1-min increments.	2 min
5	DAILY TIMER SETTINGS	Use it to set the time at which the control panel power switch is automatically turned off at a specific time on specific days of the week.	None (may be any day from Sunday to Saturday)

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3. Adjustment/Cleaning

The machine is adjusted before shipment from the factory, but the type of copy paper or original can cause discrepancies in relation to original sizes and densities. To correct such problems, the user may execute the following modes for adjustment/cleaning.

No.	Item	Description	Factory settings
1	Zoom Fine-Adjustment	Use it to fine adjust slight discrepancies noted between original and copy sizes in relation to vertical and horizontal reproduction ratios. Range: –1.0% to +1.0% Unit: 0.1%	0
2	Exposure Recalb.	Use it with the density adjustment memory at its center value to adjust the copy density when making copies of a typical original (without dirt or fogging).	5* 1~9
3	Feeder Cleaning	Use it to clean the pick-up roller assembly by placing copy paper in the feeder and circulating it inside the feeder.	None
4	Roller Cleaning	Use it to clean the roller cleaning assembly if copies are soiled.	None

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V. ROUTINE WORK BY THE USER

Advise the user to clean the following at leas once a week:

1) Copyboard Glass
   Wipe it with a moist cloth; thereafter, dry wipe it.
2) Copyboard Cover/RDF Feeding Belt
   Wipe them with a cloth moistened with a solution of mild detergent; then, dry wipe them.

Advise the user to perform the following when image faults (e.g., vertical white spots) are noted:

1) Clean the charging roller and the transfer roller in user mode.
2) Clean the separation static eliminator.

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VI. SAFETY

A. Laser Beams

Since laser beams can be haemful to the human body, the copier's scanner system is enclosed within a protective housing and external covers, thereby preventing leakage of laser beams outside.

For this reason, there is no likehood of the user's coming into contact with laser beams.

The copier is approved as a Class 1 laser product under IEC825 and, in the USA, as Class under the Code of Federal Regulations (1040.10 of Title 21); see the label in Figures 1-601 and -602 (115/220/240V models only).

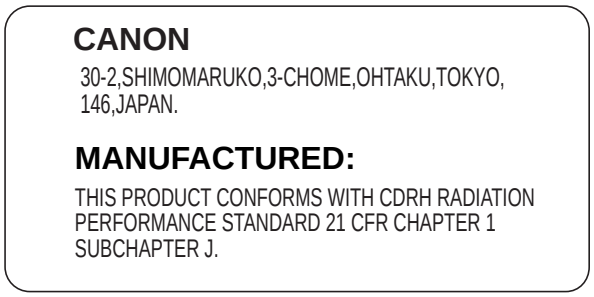

Figure 1-601 120V Model

Figure 1-602 220/240V Model

WARNING:
Do not insert a screwdriver having a high reflectance or light-reflecting objects into the laser path when servicing around the machine's laser system. Be sure to remove watches, rings, or accessories before servicing the machine.

A laser beam is a visible light, and can cause permanent damage to the eye.

You will see a label (Figure 1-603) on some covers of the machine; take extra care when servicing mechanisms under such covers.

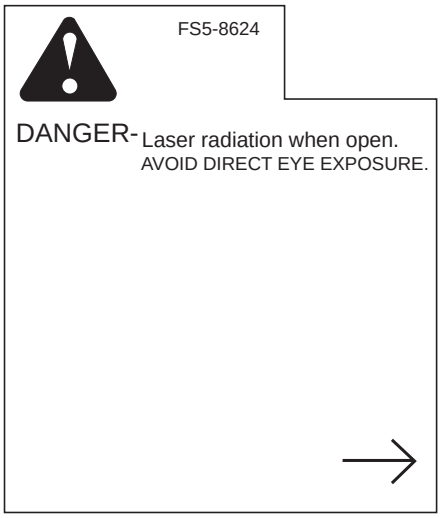

Figure 1-603

In the copier, the label is attached to the laser scanner system cover, which is used to prevent radiation of laser lights.

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B. Safety of Toner

Toner is a non-toxic material consisting of plastic, iron, and small amounts of dye.

If toner comes into contact with the skin or clothing, remove it with dry tissue and wash with water.

Do not use hot water, as such will turn the toner into gel and cause it to fuse with the fibers of the cloth. Further, do not bring toner into contact with plastic material, as such will initiate chemical reaction.

Caution:
Do not dispose of toner in fire. It may explode.

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CHAPTER 2

COPYING PROCESS

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- B. Latent Image Formation Block 2-2
- C. Pre-Exposure (step 1) 2-3
- D. Primary Charging (step 2) 2-3
- E. Laser Exposure (step 3) 2-4
- F. Development (step 4) 2-4
- G. Transfer (step 5) 2-5
- H. Separation (step 6) 2-6
- I. Fixing (step 7) 2-7
- J. Dram Cleaning 2-7

II. AUXILIARY PROCESS 2-8

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I. IMAGE FORMATION

A. Outline

The GP215/GP200 uses an indirect photographic method of reproduction and is constructed as shown in Figure 2-101.

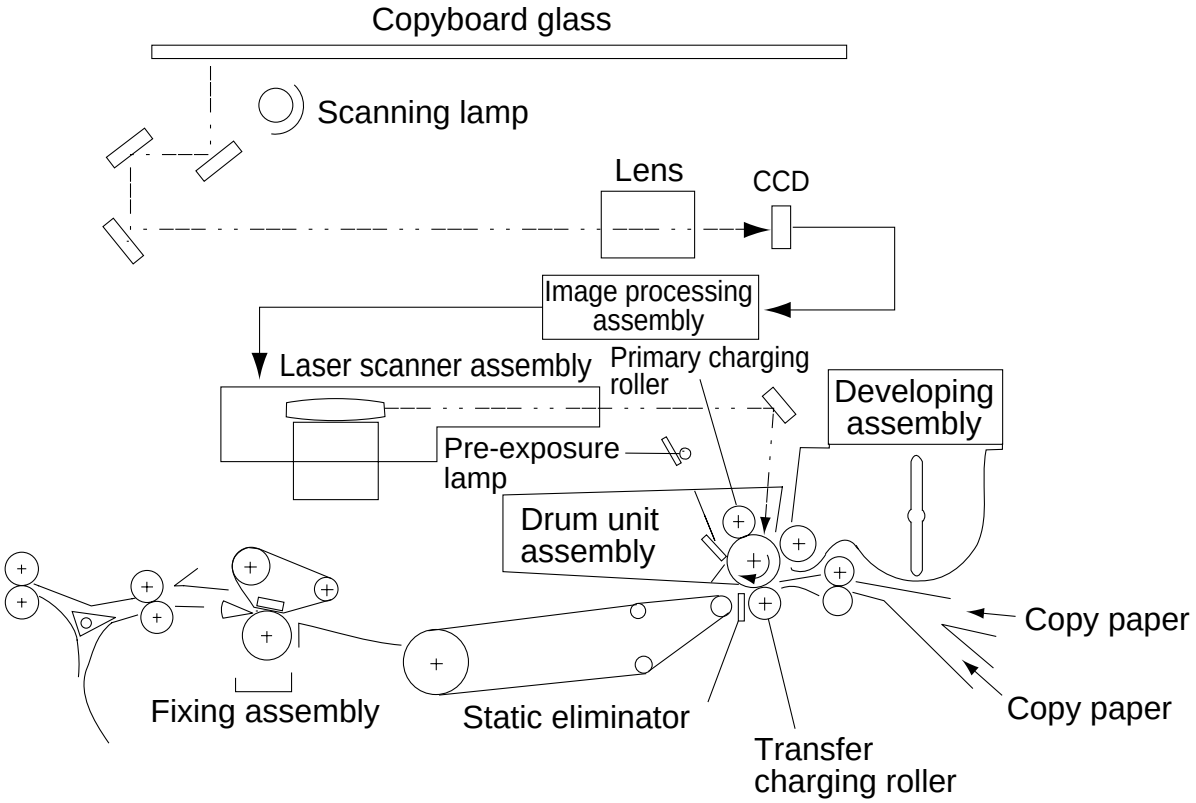

Figure 2-101

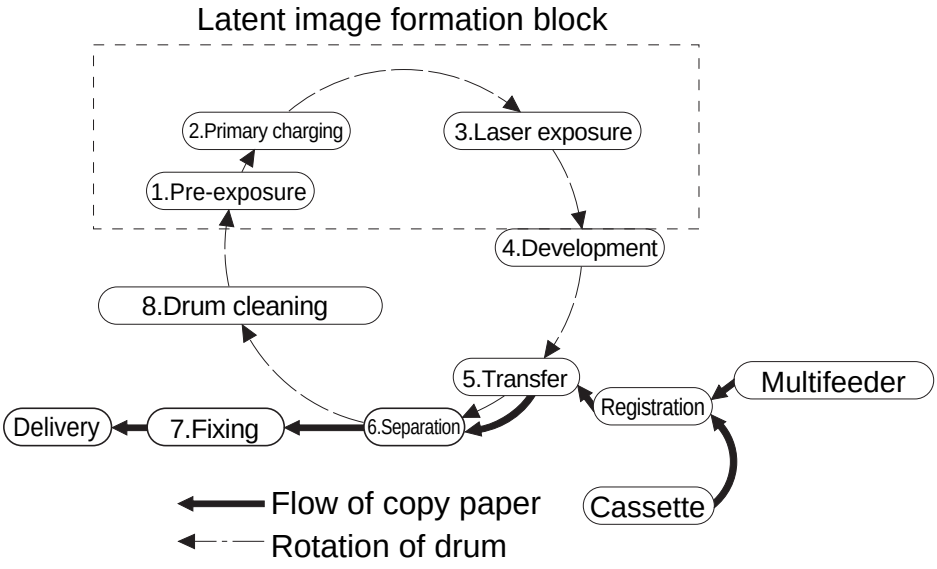

Figure 2-102

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The GP215/GP200's image formation process consists of the following steps as discussed in sequence:

Step 1 Pre-exposure
Step 2 Primary charging (AC + negative DC)
Step 3 Laser exposure (AC + negative DC bias)
Step 5 Transfer (positive DC)
Step 6 Separation (negative DC)
Step 7 Fixing
Step 8 Drum cleaning

The photosensitive drum has a layer construction: the outside is a photoconducting layer of OPC and the inside, conductive aluminum substrate.

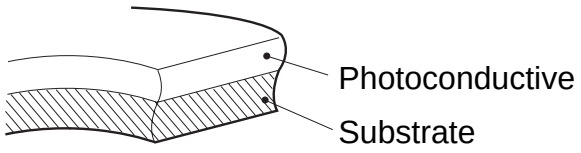

Figure 2-103

B. Latent Image Formation Block

The latent image formation block consists of three steps, at the end of which negative charges are left behind in the areas on the drum corresponding to the white areas of the original and negative charges are removed from the areas on the drum corresponding to the black areas of the original.

Such images on the drum created by negative charges are not visible to the human eye and are therefore called static images.

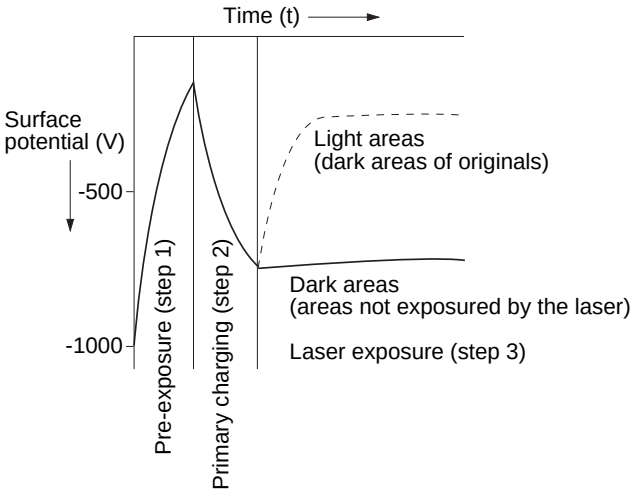

Figure 2-104

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C. Pre-Exposure (step 1)

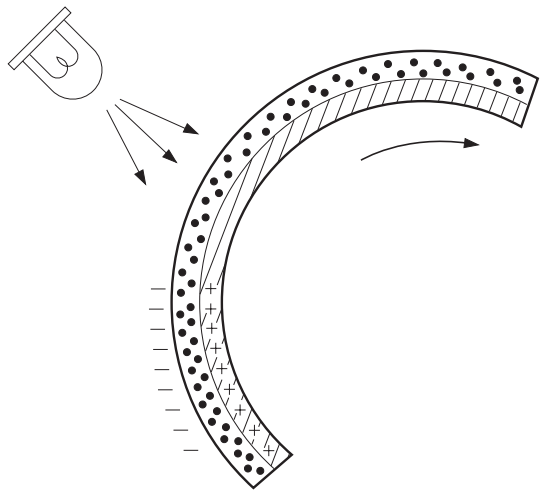

Figure 2-105

Before executing primary charging, light from the pre-exposure lamp is directed to the surface of the drum (pre-exposure), thereby removing residual charges from the surface and, ultimately, preventing uneven copy density.

D. Primary Charging (step 2)

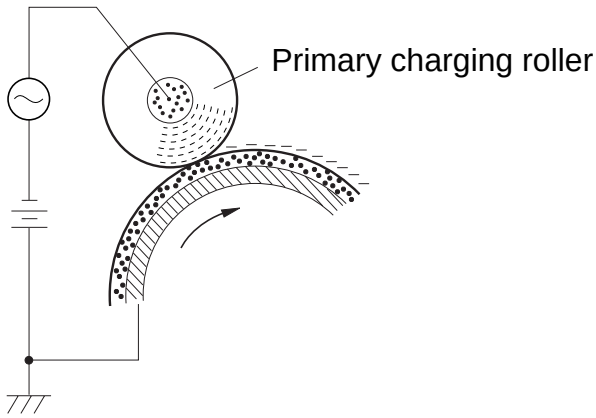

Figure 2-106

The GP 215/GP200 uses a charging roller made of conducting rubber so as to charge the photosensitive drum directly for primary charging. The use of direct charging requires less application voltage than conventional corona charging and produces virtually no ozone.

An AC bias is applied to stabilize the charges applied to the photosensitive drum.

The primary charging roller is a special roller and is not the same as the transfer roller.

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E. Laser Exposure (step 3)

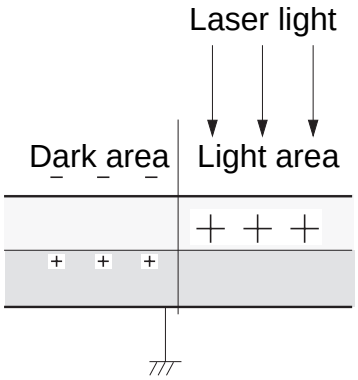

Figure 2-107

In this step, a laser representing the dark areas of the original is directed to the surface of the drum to neutralize the existing charges. The areas on the photosensitive drum which have been exposed this way are called light areas and will later attract toner in step 4 (development).

F. Development (step 4)

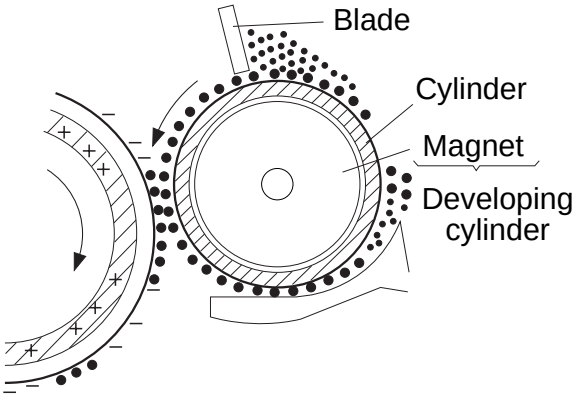

Figure 2-108

In this step, the static image on the surface of the drum is turned into a visible image by toner.

As shown in Figure 2-108, the developing assembly consists of a developing cylinder (made of a fixed magnet and a cylinder rotating around it) and a magnetic blade.

The main ingredients of the toner are magnetite and resins. The toner has insulating properties and is charged to a negative potential by friction against the cylinder.

The GP215/GP200 deposits toner over the areas on the surface of the drum whose charges have been neutralized by a laser beam (light areas); for this reason, the polarity of the toner is negative, which is the same as the polarity of primary charging.

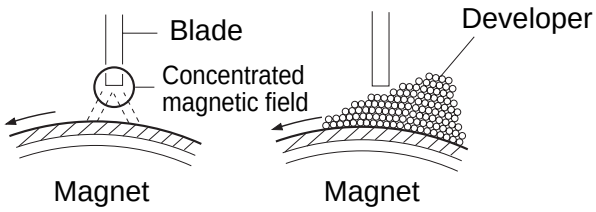

Figure 2-109

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A concentrated magnetic field occurs from the magnet to the edge of the blade, attracting toner.

Once inside the field, the toner becomes virtually immobile because of the strong bond with the blade so that, when deposited, it forms an even, thin layer on the cylinder.

An AC bias and a DC bias (negative component) are applied to the developing cylinder and the blade at the same time (developing bias); the negative component of the developing bias is stronger than the positive component.

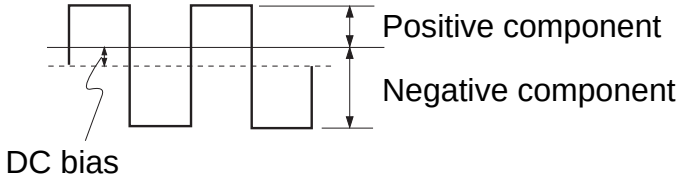

Figure 2-110

During copying, toner is attracted to the light areas of the photosensitive drum by the work of the negative component of the developing bias, thereby turning the latent image into a visible image. The excess toner is removed from the photosensitive drum by the positive component of the developing bias and the drum surface potential.

G. Transfer (step 5)

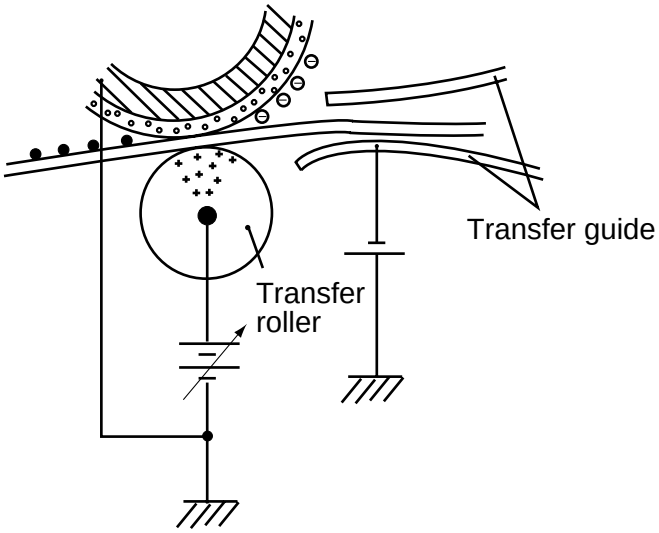

Figure 2-111

Positive charges are applied to the back of the copy paper by the transfer roller to transfer the toner image from the drum surface to copy paper.

The GP215/GP200 uses a roller transfer method, which requires less transfer voltage than a corona transfer method and generates virtually no ozone.

To prevent transfer faults or soiling of the back of copy paper, the transfer guide is given a negative bias.

Reference:

If the transfer guide was grounded, the charges for use on the back of copy paper would escape, leading to transfer faults. If separated completely, the transfer guide would be charged, soiling the transfer guide and ultimately soiling the back of copy paper.

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Reference:

If the image on the photosensitive drum was not fully transferred to the copy paper because of a jam, toner can stick to the transfer charging roller.

The GP215/GP200 uses negative transfer voltage during initial rotation and last rotation to return any such toner (charged to a negative potential and sticking to the transfer roller) to the photosensitive drum.

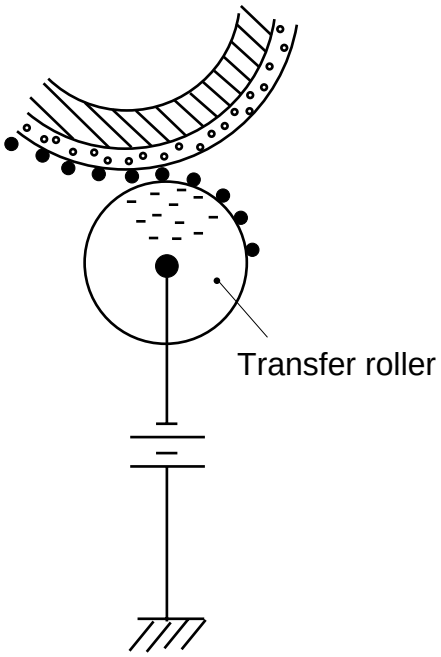

Figure 2-112

H. Separation (step 6)

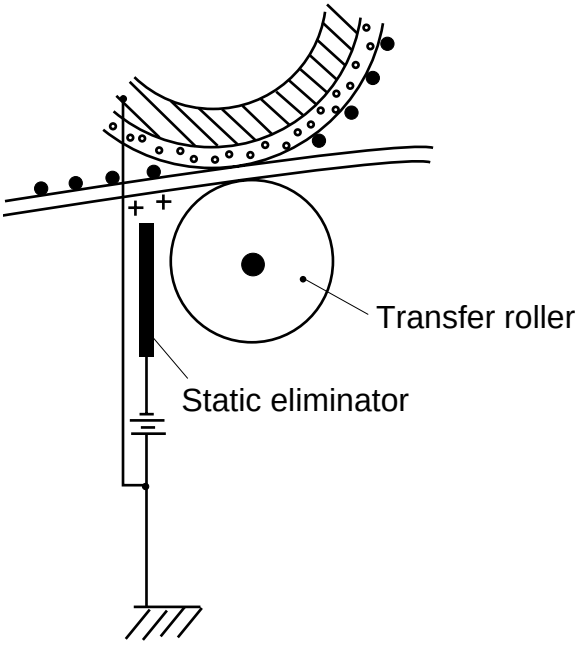

Figure 2-113

The GP215/200 takes advantage of the rigidity of copy paper to separate paper from the drum (curvature separation). Since thin paper has little rigidity,it tends to remain wrapping on the drum. To prevent such a problem, a negative voltage is applied to the separation static eliminator, thereby weakening the static bond between drum and copy paper for better separation.

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I. Fixing (step 7)

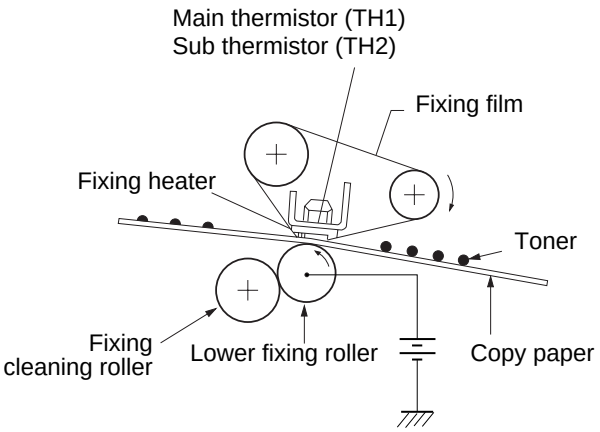

Figure 2-114

After transfer, the copy paper is moved through the fixing film and the lower fixing roller so that the toner image will be fused into the fibers of the paper.

The fixing heater is a plane-shaped heater; it serves to eliminate warm-up time by heating the area of contact with the fixing film.

The temperature of the fixing heater is monitored by the main thermistor (TH1) located at the center of the heater. (The fixing heater is controlled to a specific temperature at all times.)

A sub thermistor (TH2) is provided at the end of the fixing heater to monitor the temperature of the area which remains free of contact with paper when small-size paper is moved through the fixing assembly, thereby preventing overheating.

The fixing cleaning roller is made of aluminum and is kept in contact with the lower fixing roller to remove toner from the lower fixing roller. (It also serves to discharge heat from the lower fixing roller.)

The metal core of the lower fixing assembly is given a positive bias to prevent offset of toner to the fixing film.

J. Drum Cleaning

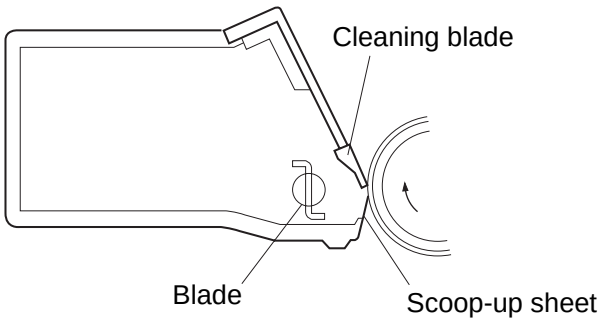

Figure 2-115

The toner remaining on the drum surface is scraped by the cleaning blade in preparation for the next copy. When scraped off the drum surface, the toner is collected by the scoop-up sheet and is forwarded to the rear by the blade.

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II. AUXILIARY PROCESS

1. Delivery Static Eliminator

Copy paper immediately prior to delivery holds residual charges from transfer, and a static eliminator (grounded brush) is provided at the delivery slot to remove such charges.

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CHAPTER 3

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I. BASIC OPERATION

A. Functional Construction

The GP215/GP200 can be divided into seven functional blocks: pick-up/feeding system, original exposure system, image processing system, laser exposure system, image formation system, communication system, and control system.

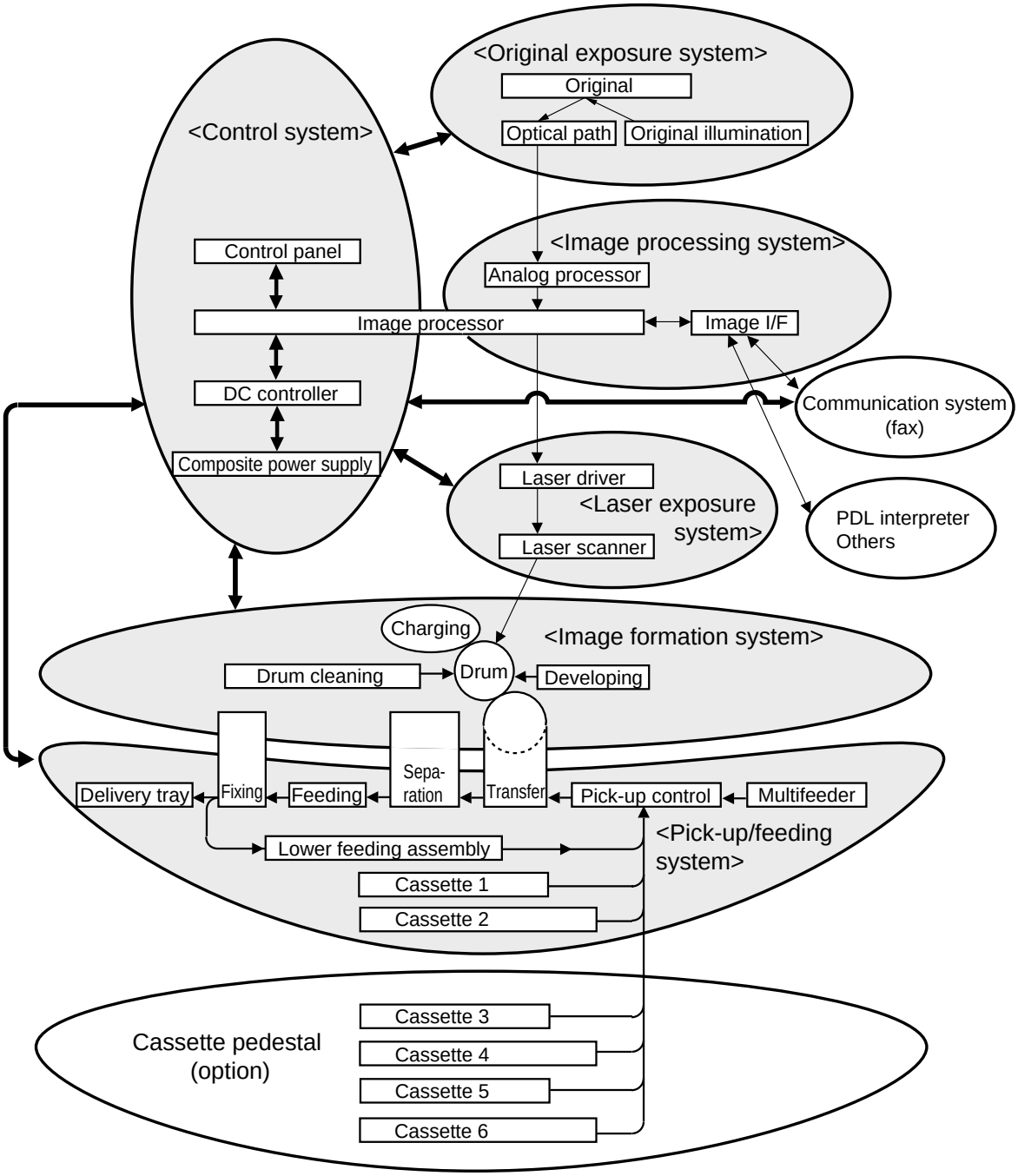

Figure 3-101

B. Outline of the Electrical Circuitry

1. Control Division

The GP215/GP200's electrical mechanisms are controller by the CPU on the PCBs shown in Figure 3-102. See Table 3-101 for an idea of the functions of the CPU and the functions of the ROMs/RAMs and the ICs around the CPU.

a. Image Processor PCB

Name	IC No.	Description
CPU	IC506	• Controls image processing • Controls laser operation • Controls job schedules • Controls fax sequence • Controls system memory • Detects errors • Controls DC controller PCB communications • Controls serial communications (for FLASH ROM downloading) • Controls the control panel • Controls the feeder/editor • Controls fax communications • Controls copying sequence • Controls the power supply • Controls control panel communications
ROM (FLASH ROM)	ROM DIMM IC1 IC2	• Contains control programs • Controls copying operations • Controls fax operations • Control panel message
MASK ROM	IC564	• Controls fonts (e.g., fonts used for fax headers)
RAM	IC650 IC651	• Stores service mode, user mode, various parameters
DP RAM	IC528	• Controls communication with the DC controller PCB

Table 3-101a

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b. DC Controller PCB

Name	IC No.	Description
CPU	IC101	• Controls pick-up/feeding operations • Controls the pedestal • Controls high-voltage sequence • Controls the laser scanner motor • Detects jams • Controls service mode • Controls the IPC • Controls the sorter • Controls fixing • Controls the main motor • Controls the scanner motor • Detects the cassette/paper • Detects original size
ROM	IC103 IC104	Contains control programs
IPC	IC108	Controls sorter/RDF/ADF combinations

Table 3-101b

c. Composite Power Supply PCB

Name	IC No.	Description
CPU	IC605	• Controls the control system power supply • Controls high-voltage • Monitors power switch inputs/anti-condensation switch • Monitors the CI (calling indicator; fax call signal) • Controls the power supplies of loads • Controls the scanning lamp

Table 3-101c

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2. Block Diagram of the CPU

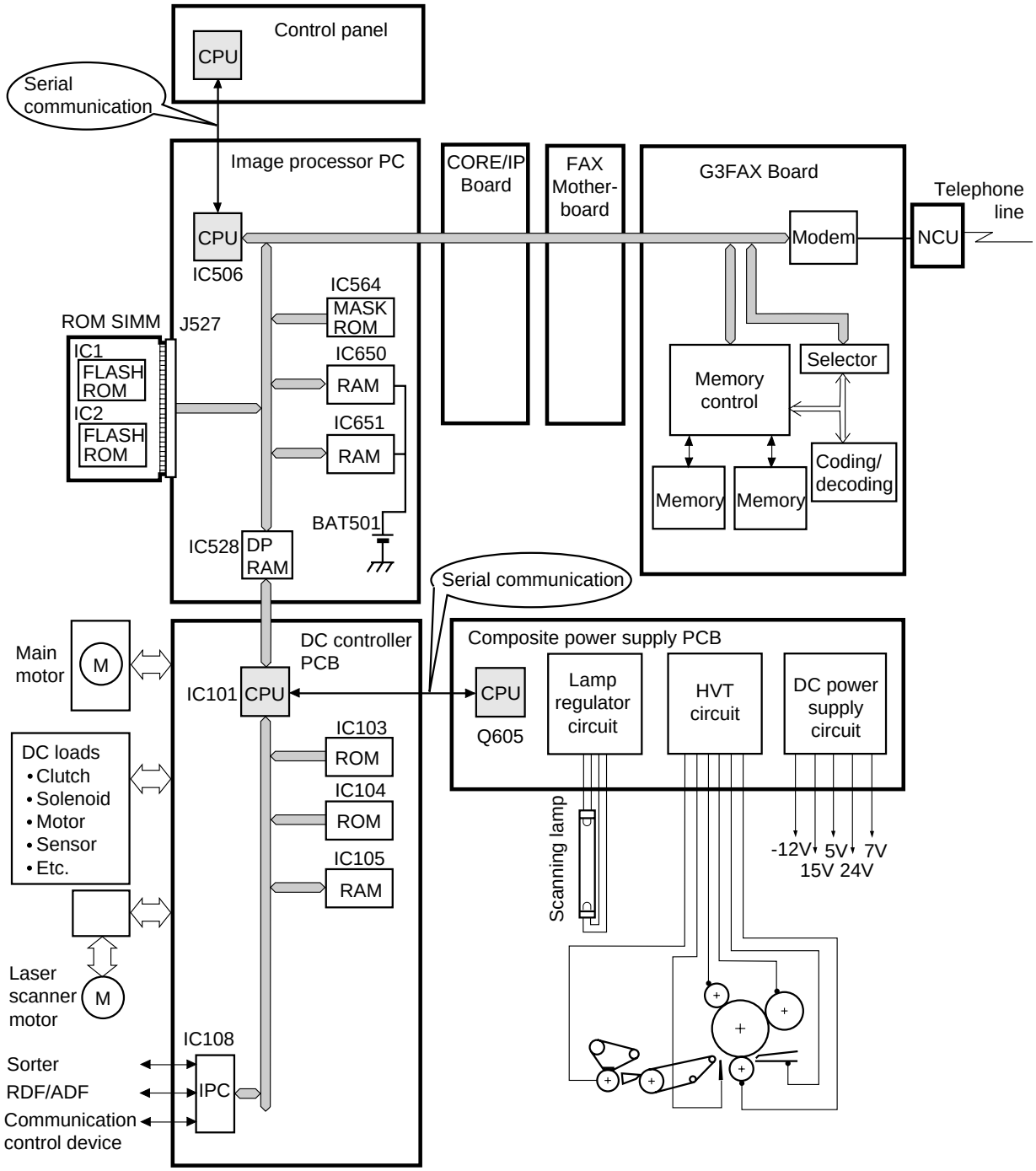

Figure 3-102

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3. General Block Diagram

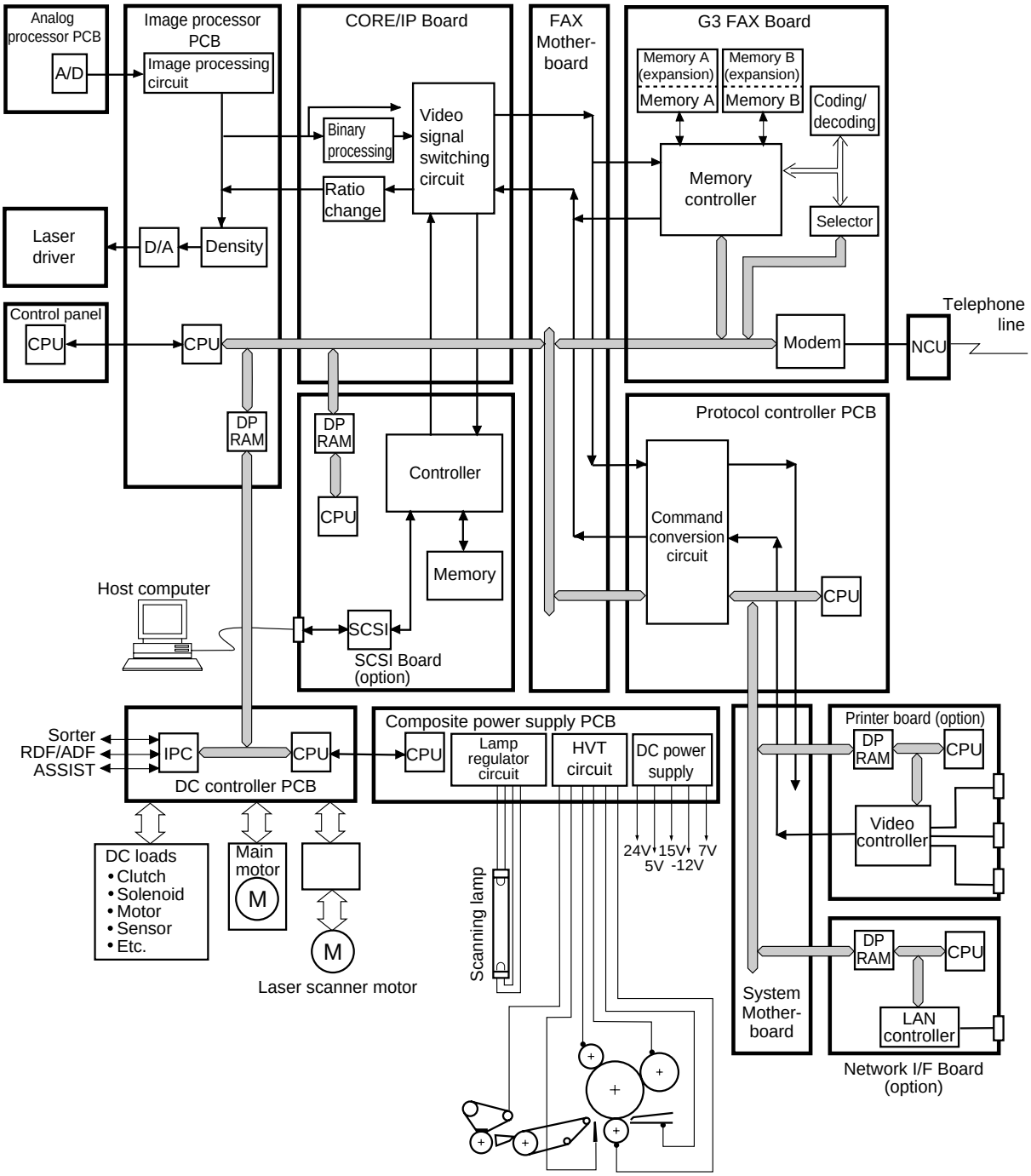

Figure 3-103

Note:
The CORE/IP Board, FAX Motherboard, and G3 FAX Board come standard with the GP215F/GP200F but are options for other models (GP215/GP200).

C. Inputs to the Major PCBs

- Composite Poser Supply Circuit (around the AC power supply)

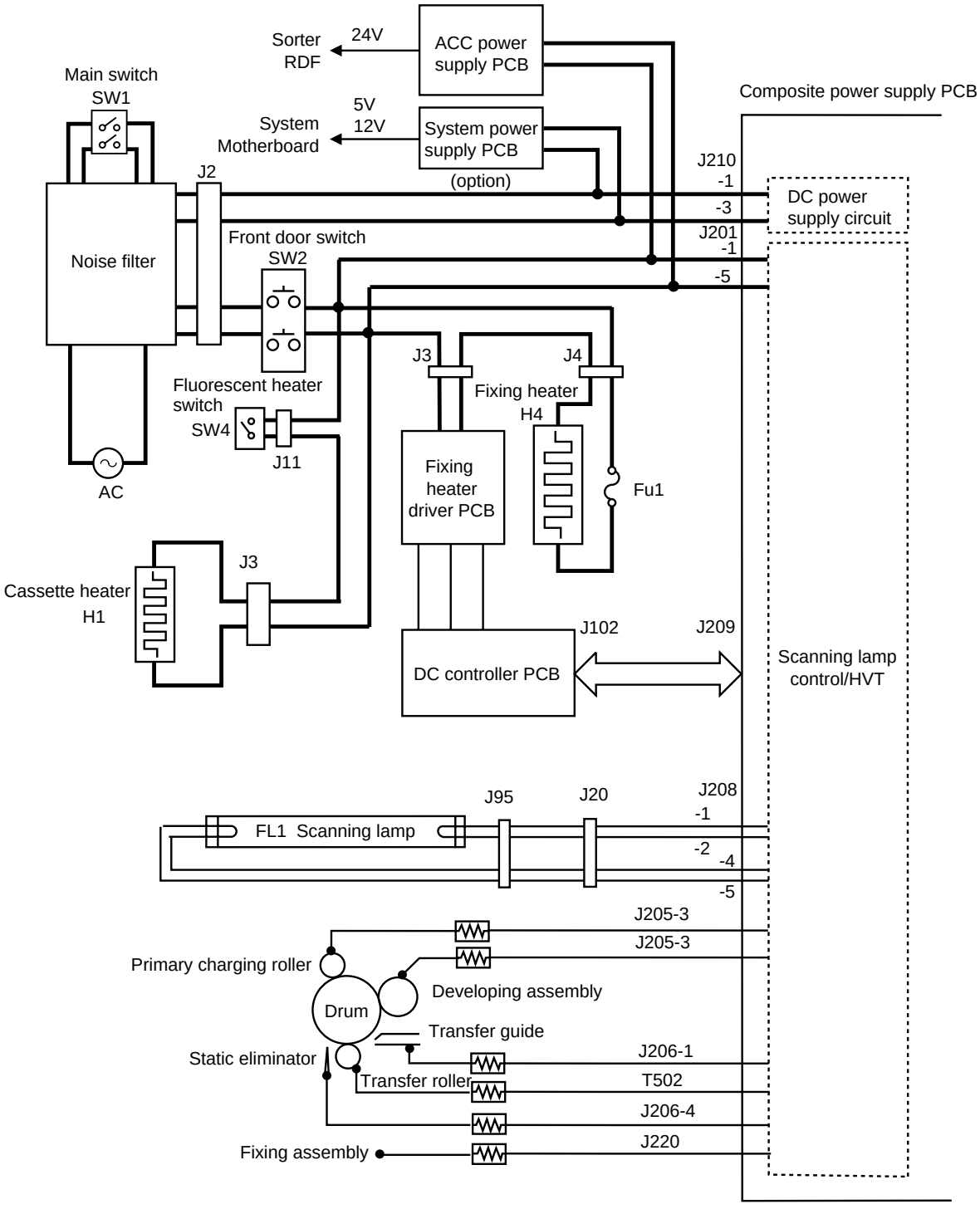

Figure 3-104

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- Inputs to and Outputs from the Image Processor PCB (1/3)

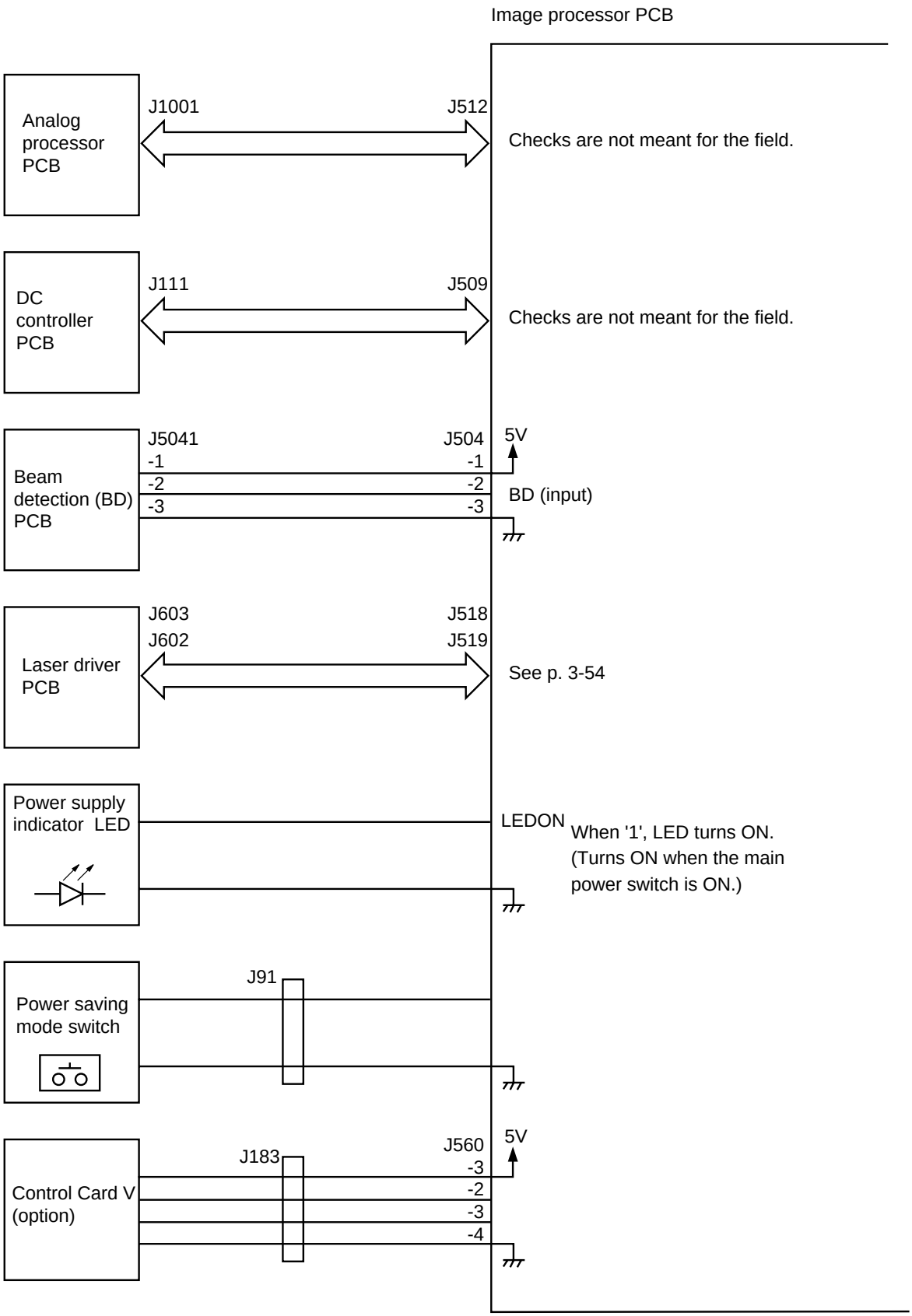

Figure 3-105

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- Inputs to and Outputs from the Image Processor PCB (2/3)

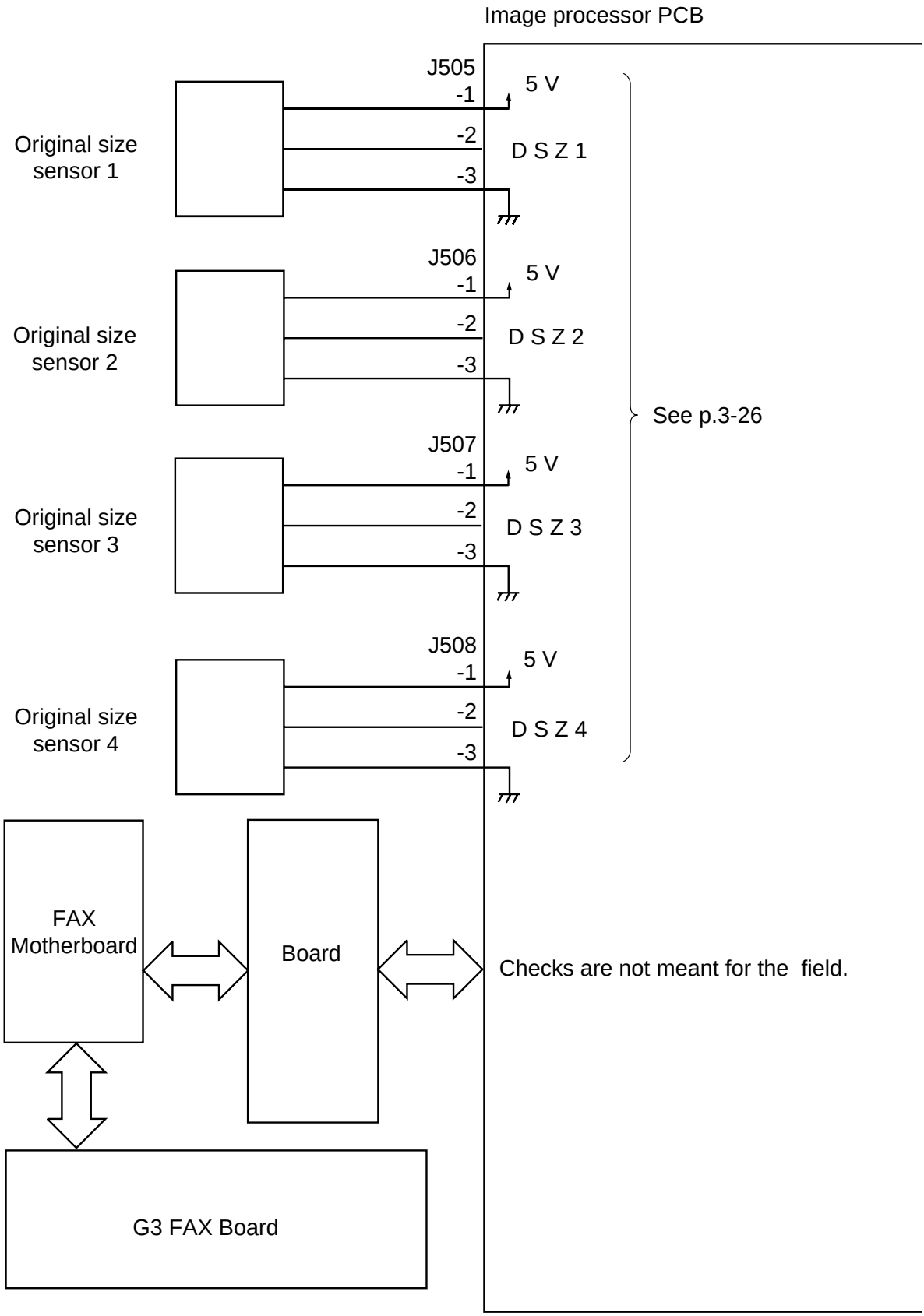

Figure 3-106

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- Inputs to and Outputs from the Image Processor PCB (3/3)

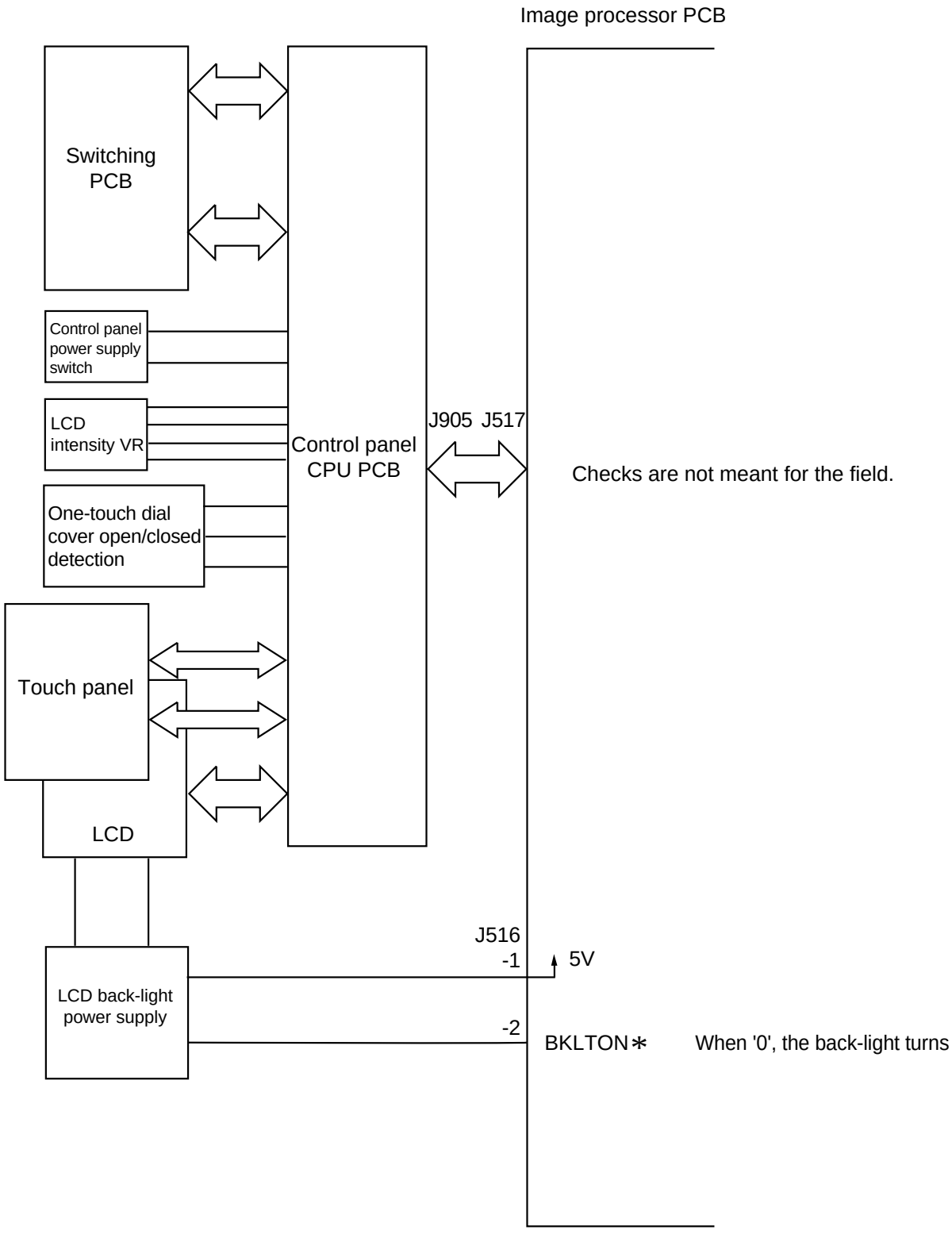

Figure 3-107

- Inputs to the DC Controller PCB (1/3)

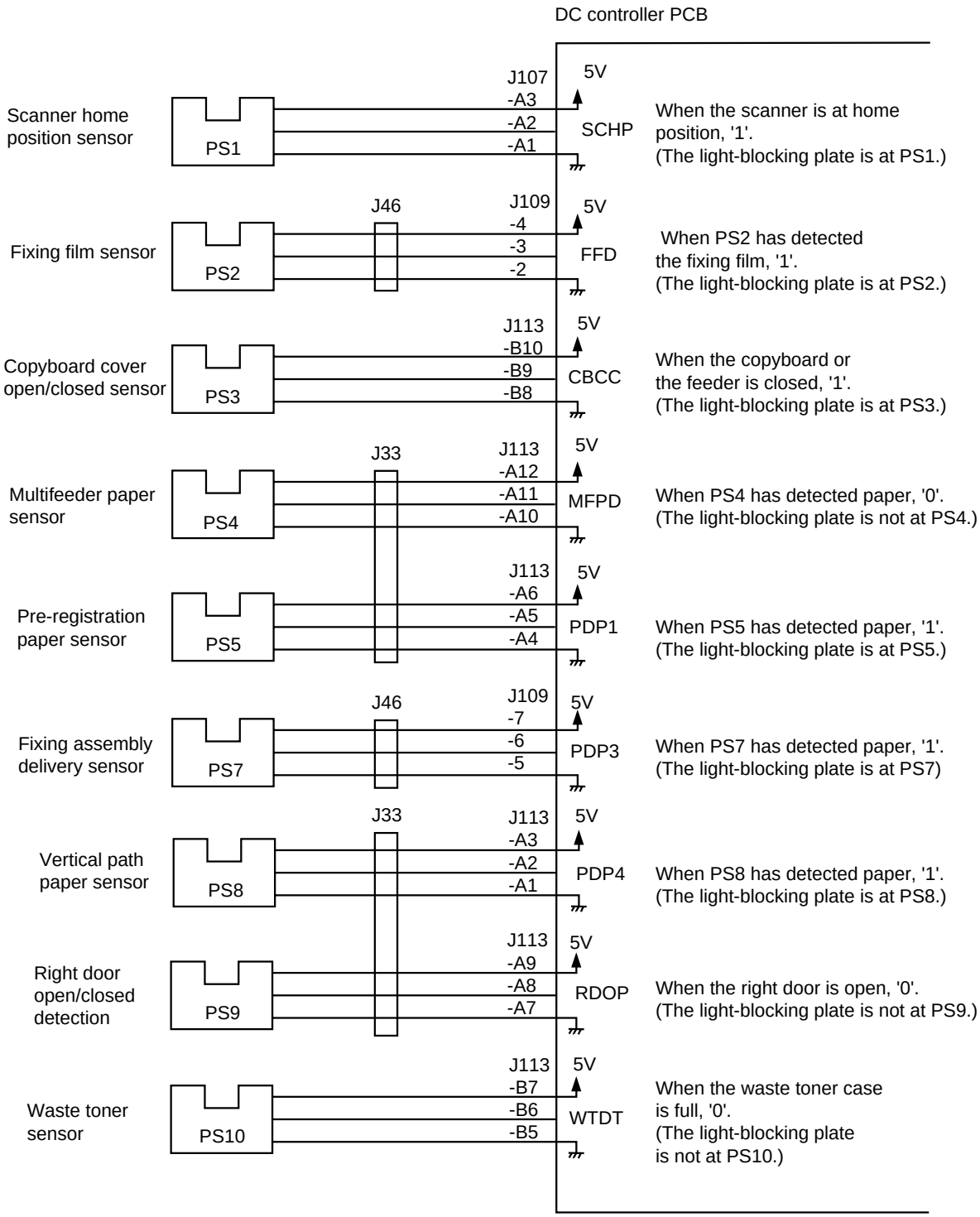

Figure 3-108

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- Inputs to the DC Controller PCB (2/3)

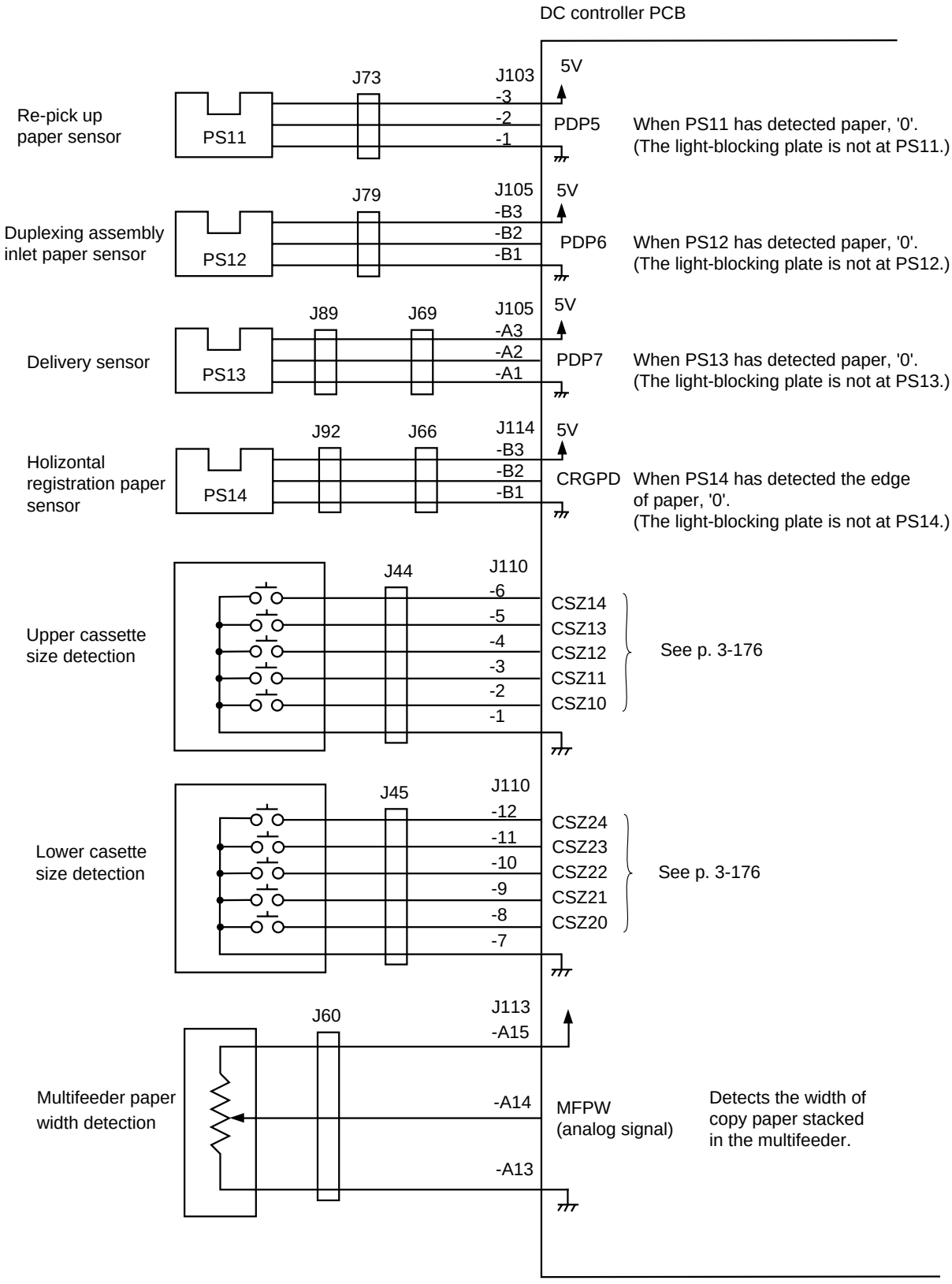

Figure 3-109

- Inputs to the DC Controller PCB (3/3)

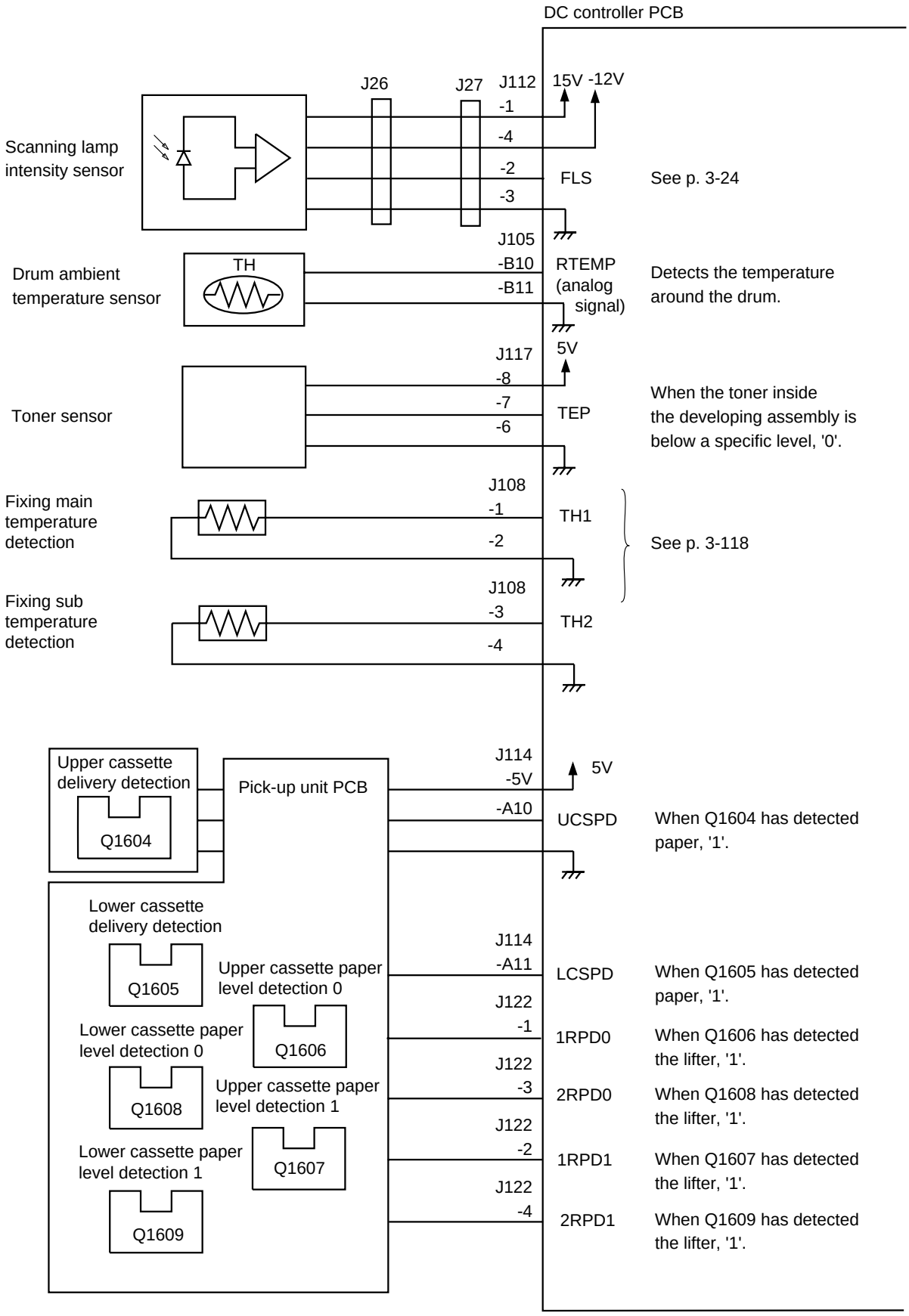

Figure 3-110

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- Outputs from the DC Controller PCB (1/3)

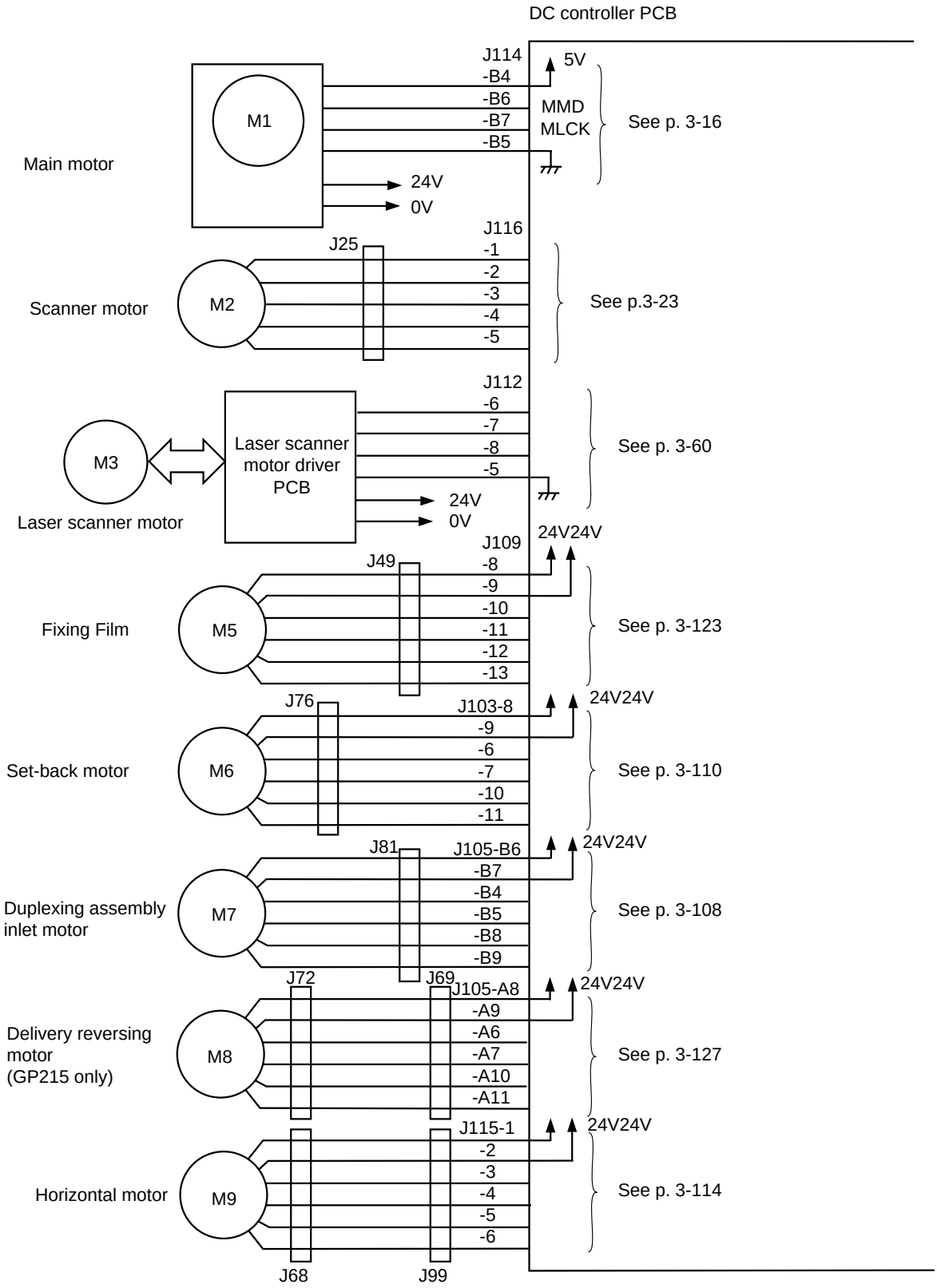

Figure 3-111

- Outputs from the DC Controller PCB (2/3)

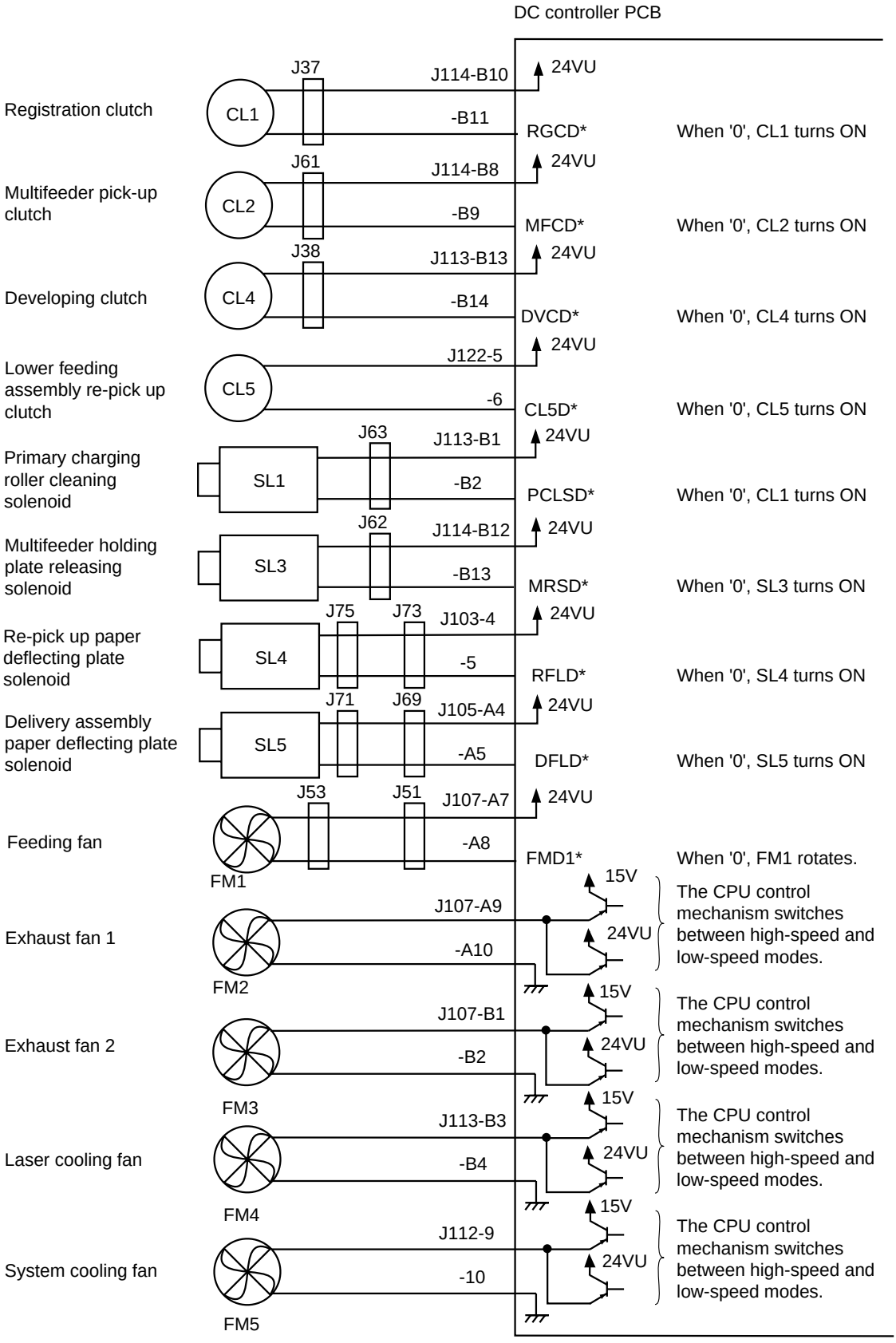

Figure 3-112

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- Outputs from the DC Controller PCB (3/3)

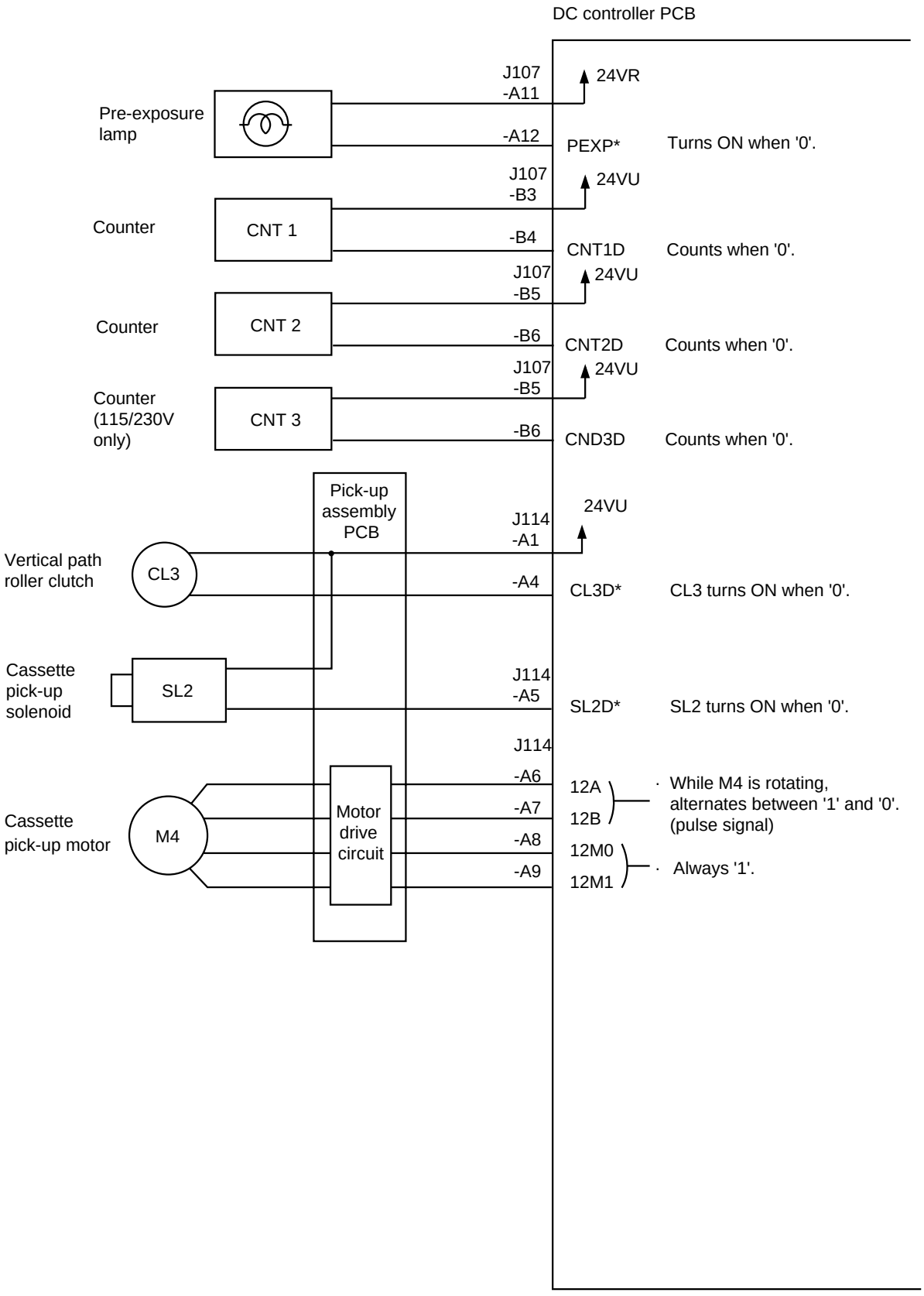

Figure 3-113

D. Main Motor Control PCB

1. Outline

The main motor (M1) is rotated and stopped in response to the drive signal (MMD) generated by the DC controller PCB, thereby driving the following loads:

- Photosensitive drum
- Developing assembly
- Feeding assembly
- Fixing assembly
- Multifeeder pick-up roller
- Registration roller
- Vertical path roller 1/2
- Delivery roller 1
- Lower feeding assembly outlet roller

Its speed, further, is controlled by the main motor control PCB.

2. Rotation

The main motor is driven by DC + 24 Vu supplied by the composite power supply PCB. When the drive signal (MMD) generated by the DC controller PCB goes '1', the control circuit on the main motor control PCB turns ON to drive the drive circuit.

The drive circuit in turn supplies drive current suited to the control of the control circuit to the main motor to rotate the motor. At this time, the output of the hall IC is returned to the drive circuit, thereby maintaining the rotation of the motor.

3. Controlling the Speed

The main motor (M1) is a DC motor with a built-in clock pulse generator which generates clock pulses (MMCLK) when the motor rotates according to the revolution of the motor.

The phase of the frequency of these clock pulses and the phase of the frequency of the reference signal are compared and controlled so that they match, thereby controlling the current to the main motor and maintaining the revolution at a specific speed.

The condition in which the phase of the clock pulses generated by the motor and the phase of the reference pulses match is called "locking," in which the constant speed state signal (MLCK=1) is sent to the DC controller PCB. If a discrepancy occurs in the revolution for some reason, MLCK will go '0'.

If MLCK remains '0' for about 3 sec, a main motor error is detected, causing all operations to stop. ('E010' will be indicated on the control panel.)

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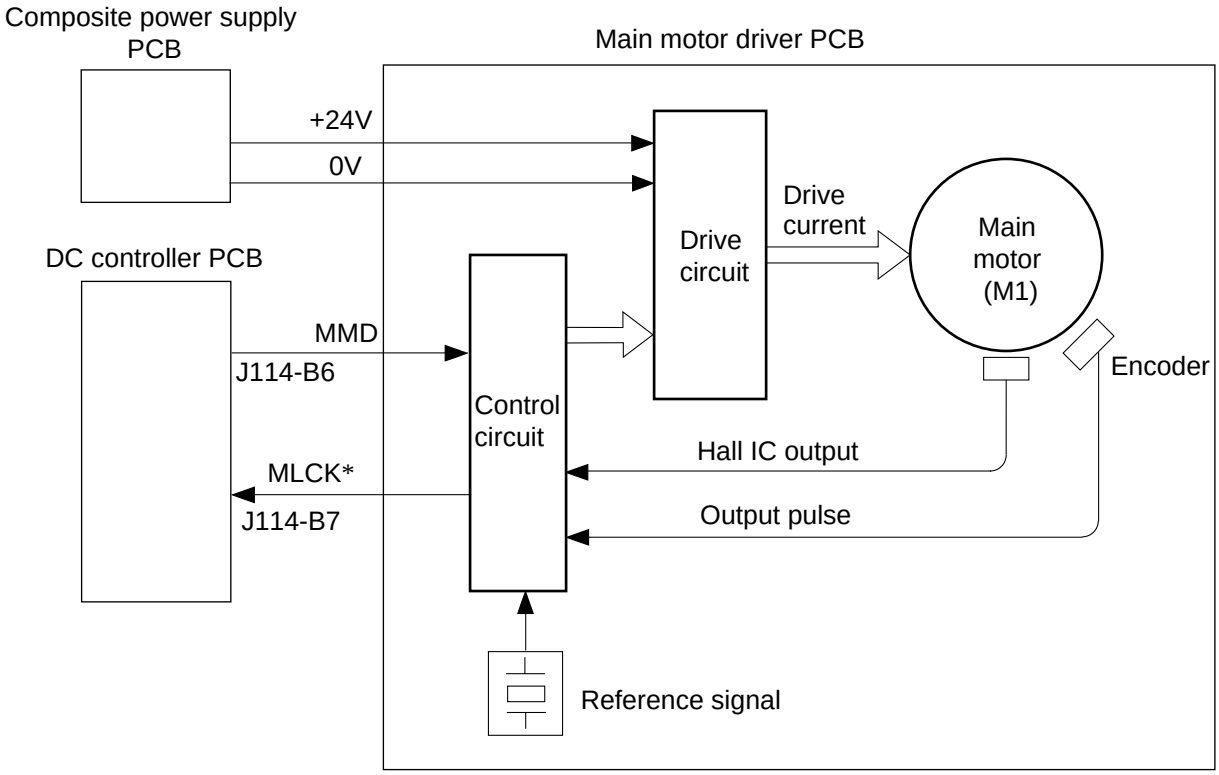
Composite power supply
PCB
Main motor driver PCB
+24V
0V
Drive
current
Drive
circuit
Main
motor
(M1)
DC controller PCB
MMD
J114-B6
Control
circuit
Encoder
Hall IC output
MLCK*
J114-B7
Output pulse
Reference signal

Figure 3-114

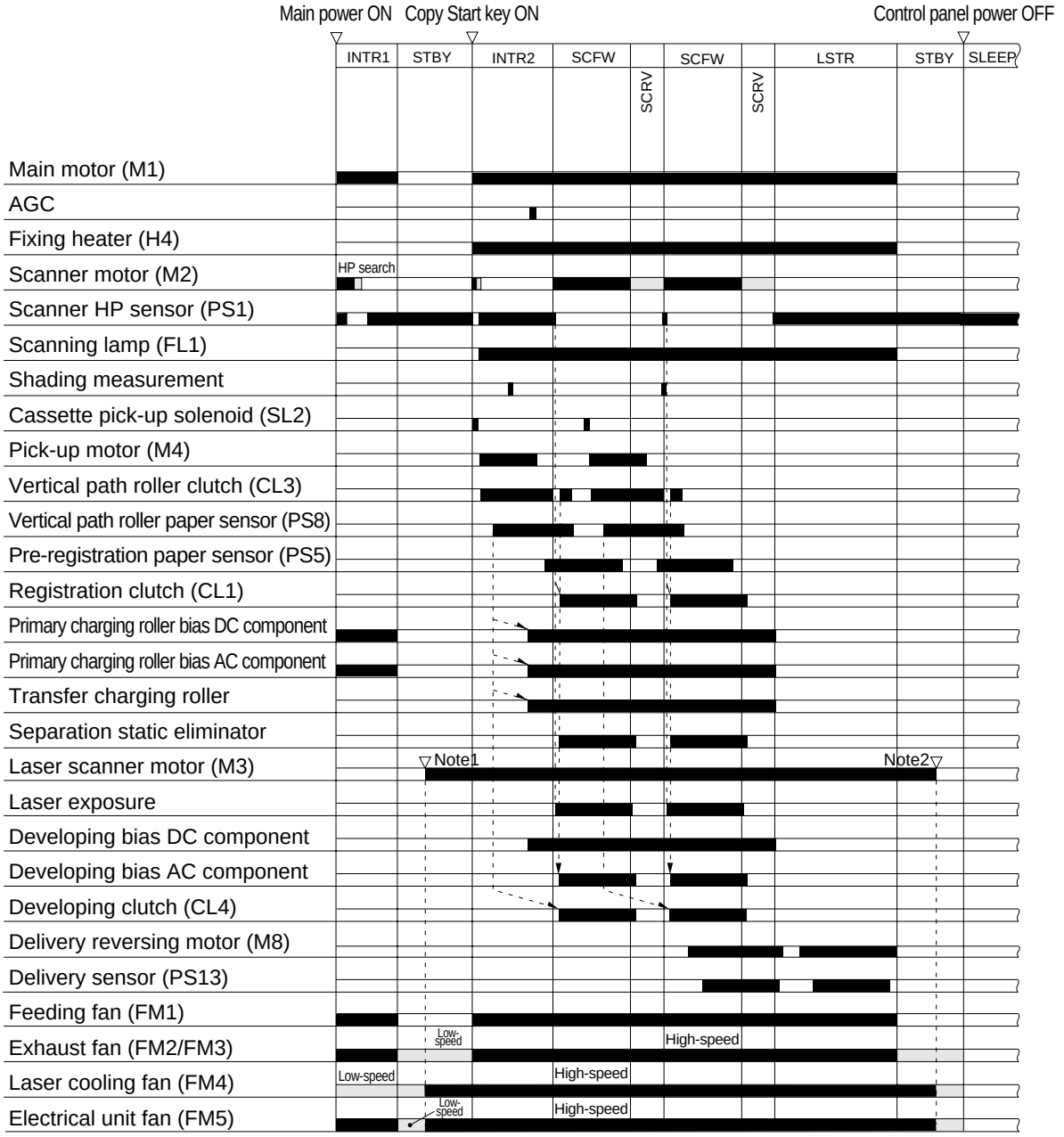

Figure 3-115

Note 1: A key on the control panel is pressed, or an original is placed in the feeder.
Note 2: Varies according to the time set in user mode (quiet mode).

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Period			Purpose	Remarks
TNTR1 (initial rotation 1)		From when the main power switch is turned ON or the front door is opened/closed until standby starts.	Measures the resistance of the drum.	
SLEEP (sleep)	Power saving mode (SLEEP 2)	When the power switch on the control panel is OFF and the main power switch is ON. Fax reception is enabled but printer functions are disabled.	Turns OFF the loads when the machine is not used for a long time (such as at night).	For details on “power saving mode” and “quick start mode,” see the appropriate descriptions under “Power Supply.”
	Quick start mode (SLEEP 1)	When the control panel power switch is OFF and the main power switch is ON. Fax reception is enabled and printer functions are enabled.		
TNTR2 (initial rotation 2)		From when the Copy Start key is pressed until the scanner starts to move forward.	• Stabilizes the drum sensitivity in preparation for copying operation. • Executes shading correction.	
SCFW (scanner forward)		While the scanner is moving forward. • The distance over which the scanner moves forward varies depending on the selected paper size and reproduction ratio. • The distance at which the scanner moves forward varies depending on the selected reproduction ratio.	The scanning lamp illuminates the original, and the reflected light is projected on the CCD through mirrors and lenses.	The scanner moves forward in reference to the vertical path roller paper detection signal.
SCRV (scanner reverse)		While the scanner is moving in reverse.	Returns the scanner to home position in preparation for the next copying operation.	
LSTR (last rotation)		From the end of SCRV until copy paper moves past the delivery sensor.	Cleans the surface of the drum as post processing (removes charges).	Discharges the last copy paper. • In 2 min after the end of LSTR, the indications on the control panel return to the Standard screen indications. (The time may be changed in common settings mode.)

Table 3-102

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II. ORIGINAL EXPOSURE SYSTEM

A. Outline

The original exposure system here refers to the functions involved between the illumination of an original and the projection of the reflected light on the CCD. Figure 3-201 shows its outline and Figure 3-202, its construction.

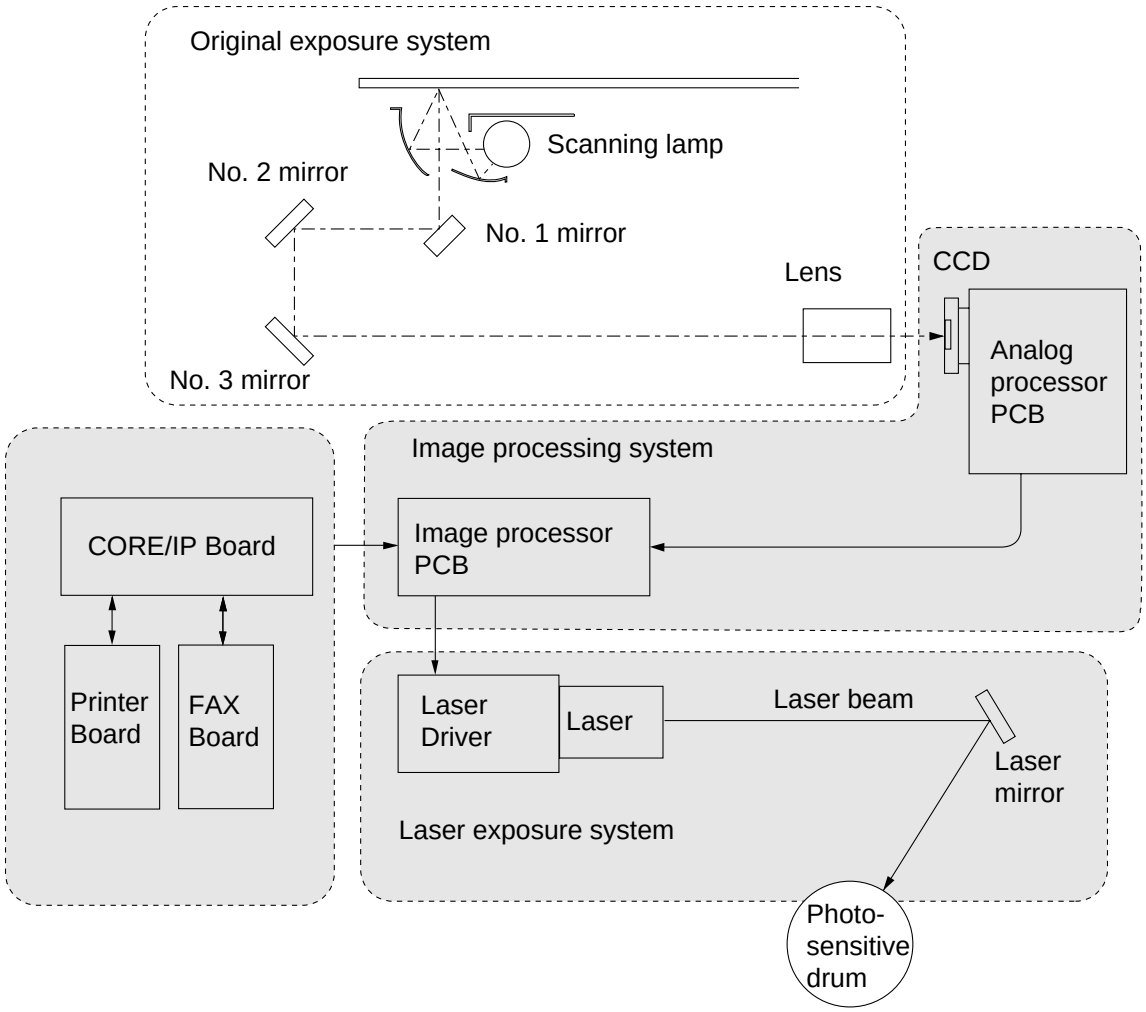

Figure 3-201

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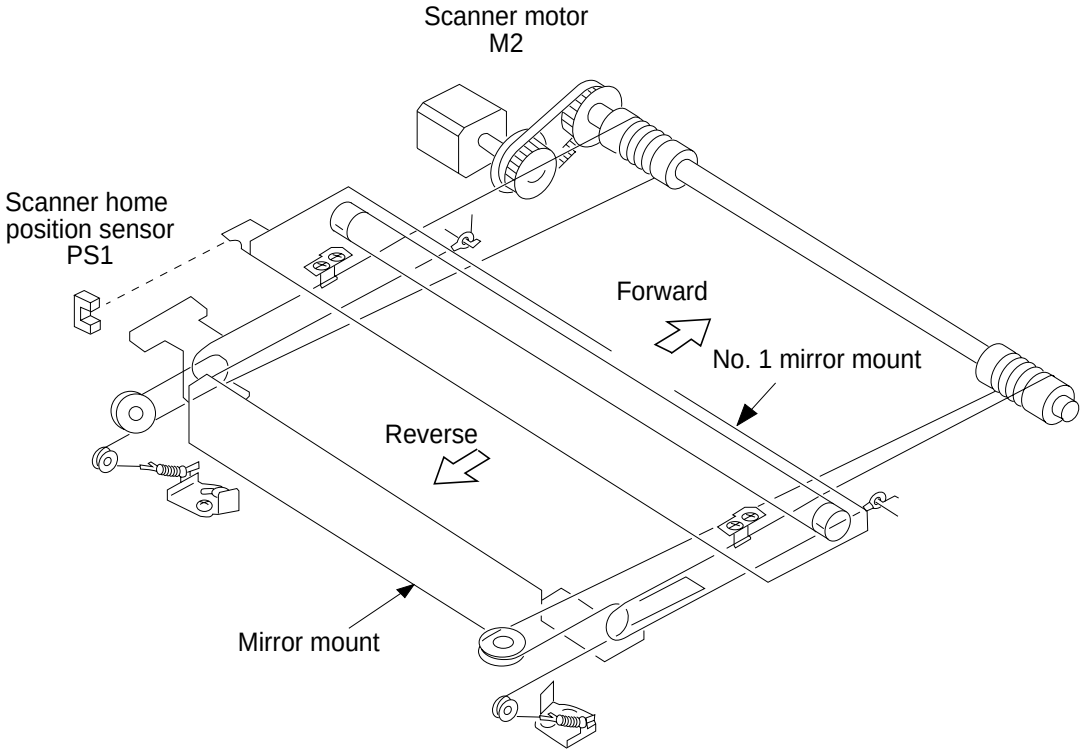
Scanner motor
M2
Scanner home
position sensor
PS1
Forward
No. 1 mirror mount
Reverse
Mirror mount

Figure 3-202

B. Varying the Reproduction Ratio

The reproduction ratio in the main scanning direction (drum axis) is changed by skipping (reduction) image signals when writing into line memory or reading a multiple number of times (enlargement) when reading from the line memory.

The reproduction ratio in the sub scanning direction, on the other hand, is changed by moving the mirror mount faster (reduction) or slower (enlargement).

C. Sequence of Operations (original exposure system)

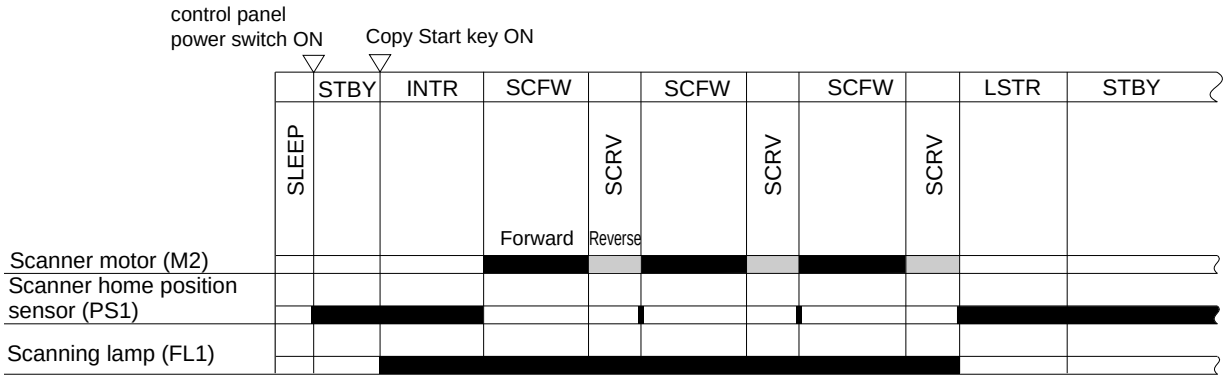

Figure 3-203

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D. Scanner Motor

1. Outline

The scanner motor (M2) is a stepping motor, and the motor is controller by the DC controller PCB.

The CPU on the DC controller PCB sends to the motor controller PCB through the I/O circuit such commands as clockwise rotation (moving the scanner forward), counterclockwise rotation (moving the scanner in reverse), and rotation speed.

The motor controller circuit operates according to the instructions of the CPU and sends pulse signals to the power control circuit. The power control circuit, in turn, supplies power to the scanner motor (M2) according to such pulse signals, thereby rotating the scanner motor (M2).

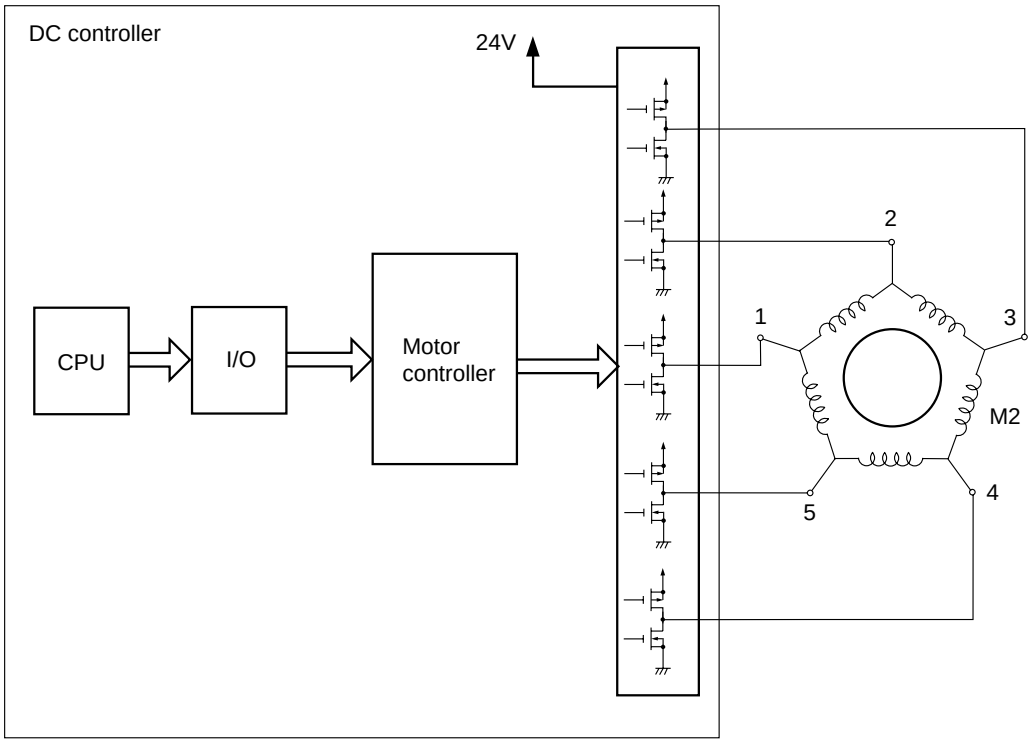

Figure 3-204

• Outline of Power Supply to M2

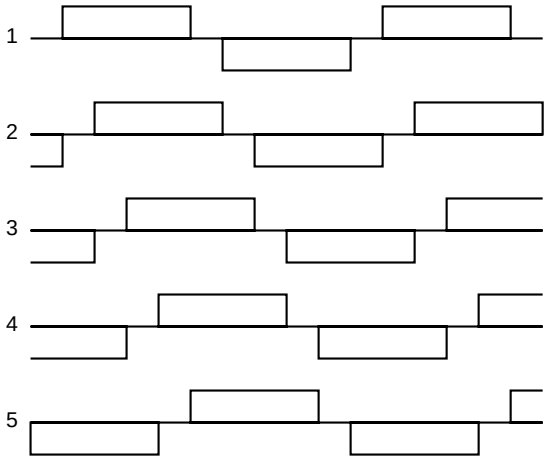

Figure 3-205

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E. Controlling the Scanning Lamp

1. Outline

The scanning lamp is a fluorescent lamp and is controlled by the composite power supply PCB (Figure 3-206) for the following:

- Controlling the scanning lamp pre-heating
- Turning ON/OFF the scanning lamp
- Controlling the intensity of the scanning lamp

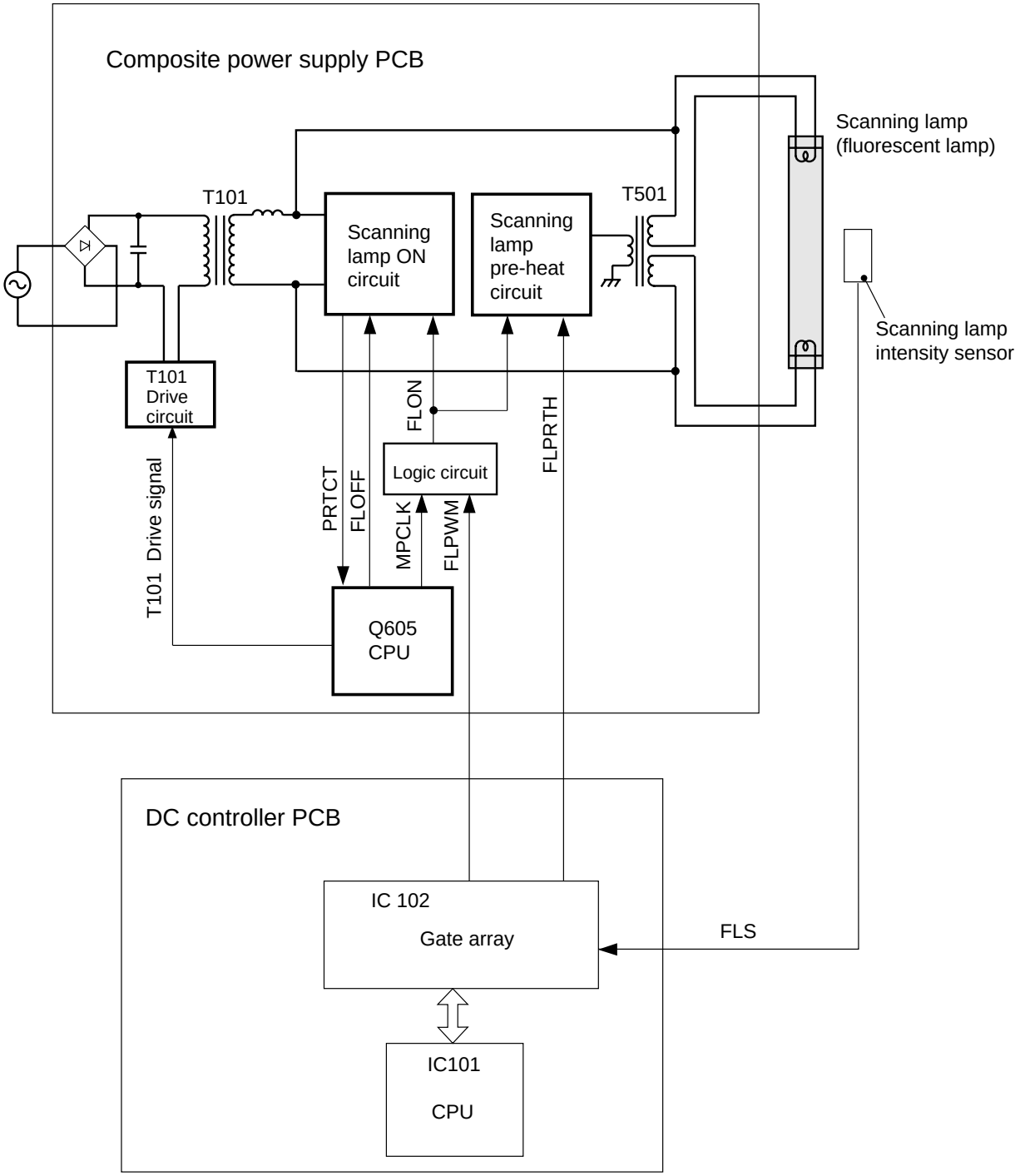

Figure 3-206

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2. Controlling Pre-Heating

The filament of the scanning lamp is powered so as to speed up the time in which the intensity of the scanning lamp reaches its optimum value after a press on the Copy Start key. (This mechanism is called pre-heating.)

Pre-heating may be full pre-heating or scanning lamp ON pre-heating.

a. Full Pre-Heating
   Power is applied during initial rotation.
b. ON Pre-Heating
   Power is applied during copying operation.

3. Turning ON/OFF the Scanning Lamp

The scanning lamp is turned ON/OFF by the lamp ON signal (FLPWM) of the DC controller PCB.

The FLPWM signal is sent to the logic circuit together with MPCLK (pulse signals) generated by the composite power supply PCB. The logic circuit uses these two signals to generate the scanning lamp ON signal, thereby turning ON the scanning lamp.

4. Controlling the Intensity

The FLPWM signal is a pulse signal used to control the intensity of the scanning lamp to a specific level by varying the duty ratio based on the results of shading automatic correction executed in service mode according to the output of the scanning lamp intensity sensor.

5. Detecting Errors

If the scanning lamp fails to turn ON in the presence of the lamp ON signal, the scanning lamp ON circuit detects the condition to generate the error detection signal (PRTCT) to the CPU.

In response, the CPU generates the scanning lamp OFF signal (FLOFF) without waiting for a command from the DC controller.

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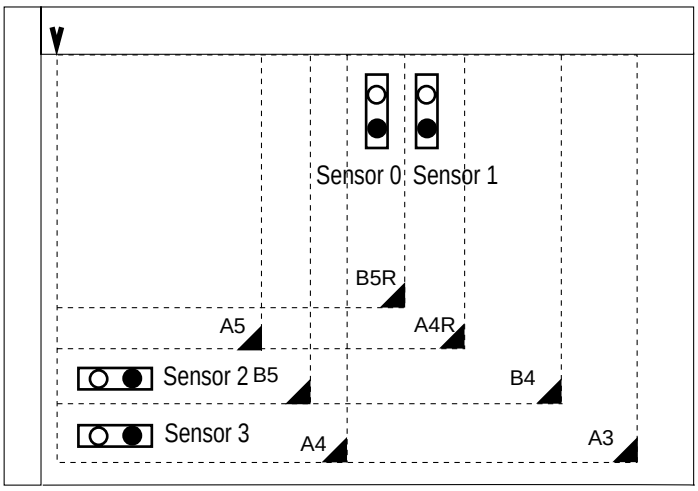
F. Identifying the Size of Originals

1. Outline

The original size detection mechanism of the copier or the feeder is used as necessary to detect the size of an original placed on the copyboard or in the feeder. The size data obtained by this mechanism is used for the following:

- Auto paper selection
- Auto ratio selection

• AB-Configuration



• Inch-Configuration

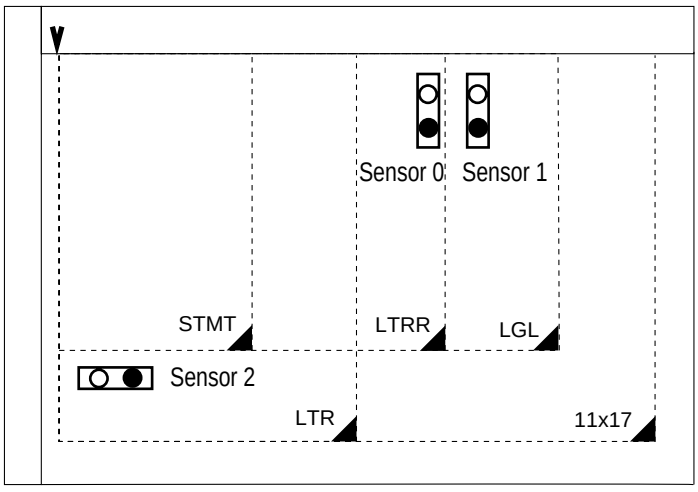


Figure 3-207 (arrangement of original sensors)

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2. Operation of Original Size Sensors

A reflecting type sensor is used under the copyboard glass to detect the size of an original placed on the copyboard glass.

When the copyboard cover is brought down to about 30°, the photointerrupter (PS3) located at the rear of the copier turns ON, i.e., the light-blocking plate blocks PS3.

The output level of each sensor is read for 15 sec or until the Copy Start key is pressed after PS3 has turned ON at intervals of 0.128 sec. The presence of an original at the sensor position is assumed if the output level remains unchanged during the period, and the size of the original is identified as shown in Tables 3-205 through -208.

This way of identifying the size enables identification of the size of black originals as well.

In the case of a/b described below, however, the output level will remain unchanged.

In the case of c described below, on the other hand, A3 will be selected with priority; if no cassette contains A3 paper, the cassette selected under standard mode will be selected.

a. A3 black original
b. Book original (The thickness of a book prevents changes in the sensor level.)
c. The copyboard cover is not closed. (PS3 is OFF.)

Reference:
In the case of a, b, or c, the size may be detected wrongly.

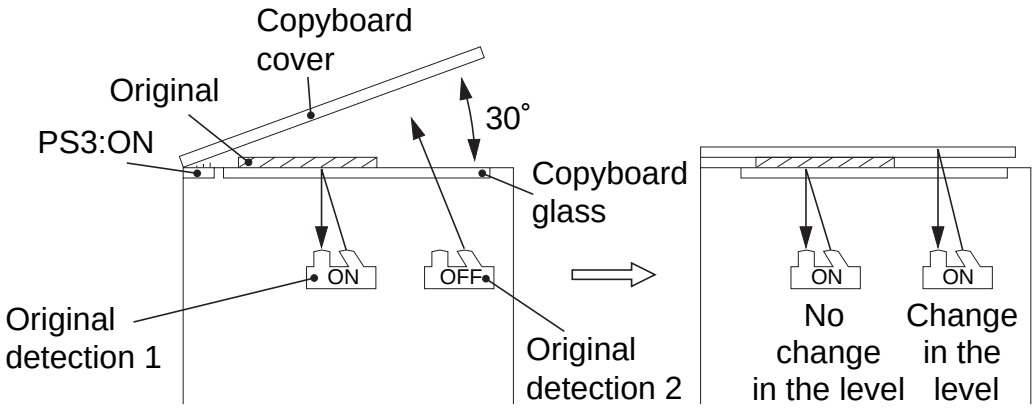

Figure 3-208

3. Detecting the Size of Originals

Using the combination of the outputs of the sensors representing the presence/absence of an original, the image processor PCB identifies the size of the original as shown in Tables 3-206 through -208.

- Same
  Indicates that there is no change in the sensor output, i.e., the presence of an original is assumed. (The sensor output is checked every 128 ms after the copyboard cover has turned ON.)
- Different
  Indicates that there is a change in the sensor output, i.e., the absence of an original is assumed. (The sensor output is checked every 128 ms after the copyboard cover has turned ON.)

Size	Original size sensor			
	0	1	2	3
A3	Same	Same	Same	Same
B4	Different	Same	Same	Same
A4R	Different	Different	Same	Same
A4	Same	Same	Different	Different
B5	Different	Same	Different	Different
B5R	Different	Different	Same	Different
None	Different	Different	Different	Different

Table 3-201 (AB-configured original)

Size	Original size sensor		
	0	1	2
11”×17”	Same	Same	Same
LGL	Different	Same	Same
LTR-R	Different	Same	Different
LTR	Same	Different	Different

Table 3-202 (Inch-configured original)

4. Identifying the Size of Originals by the Feeder

The feeder (option; RDF-G1/ADR-F1) detects the original width/original length and communicates the result to the image processor.

a. RDF-G1

The RDF-G1 identifies the size of an original in reference to the width detected by the side guide plate and the length detected in feeding direction. As such, the size is identified when the original is picked up; the sizes that can be detected are any of the following default sizes:

A-configured: A5, A4, A4R, A3
B-configured: B5, B5R, B4
Inch-configured: STMT, LTR, LTRR, FOOLSCAP, LGL, 11”×17”

b. ADF-F1

The ADF-F1 identifies the size of an original in reference to the width detected by the side guide plate and the length detected by the three sensors located on the ADF. As such, the size of an original is detected when it is placed in the feeder; the sizes that can be detected are any of the following default sizes:

A-configured: A5R, A5, A4, A4R, A3
B-configured: B6, B6R, B5, B5R, B4
Inch-configured: STMT, LTR, LTRR, FOOLSCAP, LGL, 11”x17”

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III. IMAGE PROCESSING

A. Outline

The image processing system converts the optical image projected on the CCD into electrical signals (image signals) for correction and processing.

The correction/processing functions are by the following PCBs, and the results of correction/processing are forwarded to the PCBs that follow them:

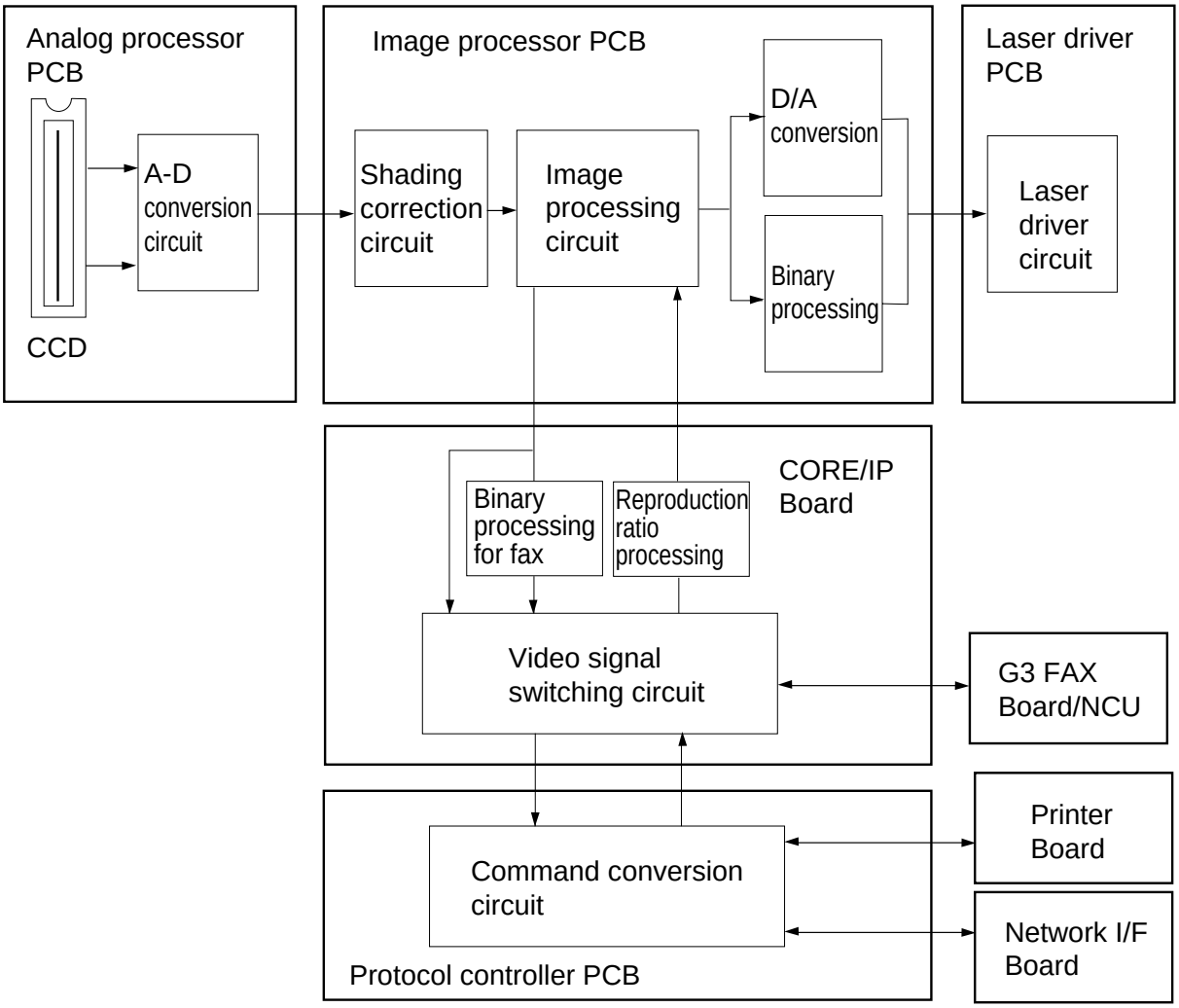

Figure 3-301

PCB	Correction/processing	Destination
Analog processor PCB	• A-D conversion • ABC (auto background control)	To the image processor PCB.
Image processor PCB	• Shading correction • Reproduction ratio processing • Filter processing • Negative/positive reversal • Framing/blanking • Density processing • Binary processing (for copy images) • D/A conversion	To the laser driver PCB and the CORE/IP PCB.
CORE/IP	• Binary processing (for fax images) • Reproduction ratio processing (for fax images and printer default transmission)	To the Fax Board through the FAX Motherboard. (also, to the electronic sorter)
FAX Board	• Coding/decoding • Rotation	To the telephone line.
Protocol controller PCB	• Protocol control • Protocol exchange (between Printer Board and Network Interface Board)	

Table 3-301

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B. Analog Image Processing

1. Outline

The analog processor PCB converts CCD drive signals and CCD output signals (analog signals) to digital signals. (It also executes AE measurement.)

2. CCD/CCD Driver

The GP215/GP200's CCD is a linear image sensor consisting of a single line of 7500 photocells. The signals subjected to photoelectric conversion in the photocell unit are forwarded to the CCD drive circuit. (The even-number pixels and the odd-number pixels are sent separately.) The CCD drive circuit synthesizes the signals coming separately in even-number units and odd-number units for output to the A-D conversion circuit.

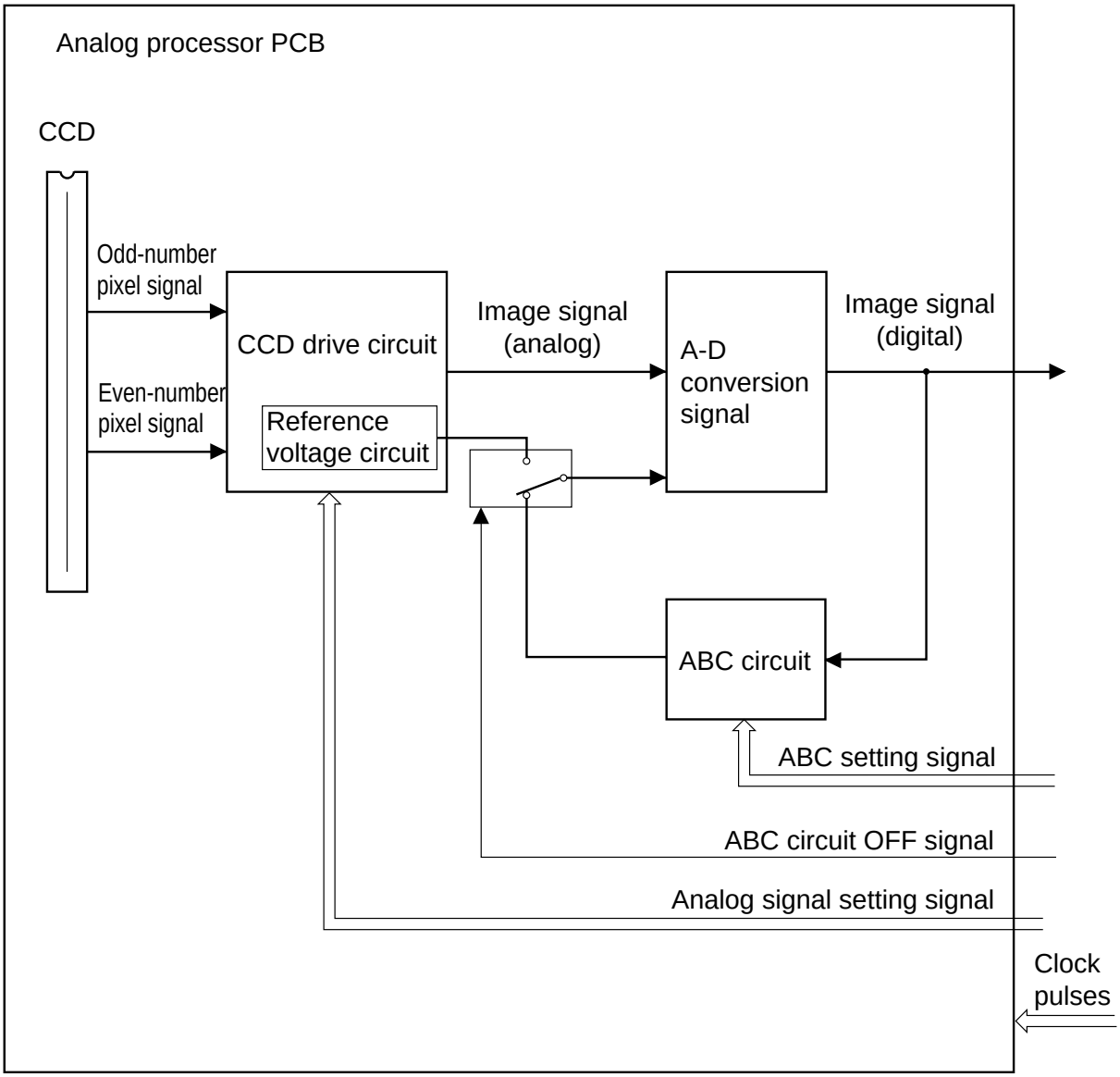

Figure 3-302

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3. A-D Conversion Circuit/ABC Circuit

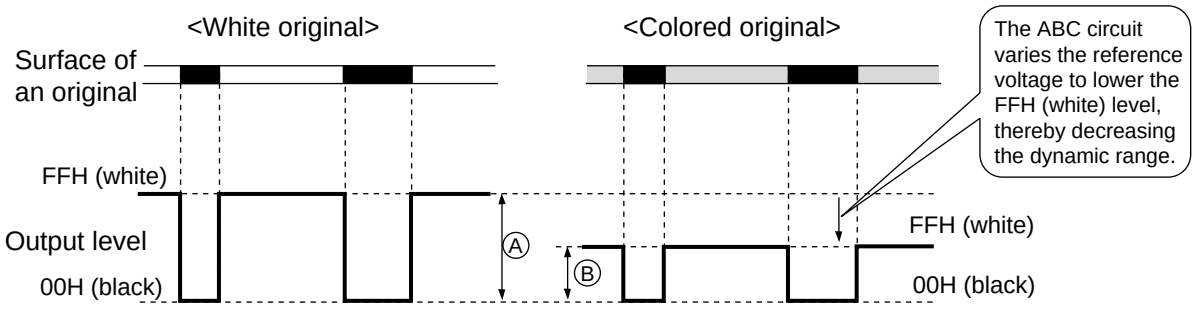
a. A-D Conversion Circuit

The A-D conversion circuit converts analog signals from the CCD to 8-bit digital image signals.

In general, the A-D conversion signal performs A-D conversion based on the reference voltage. As such, increasing/decreasing the reference voltage will increase/decrease the dynamic range (difference between maximum output level and minimum output level), affecting the signal level after A-D conversion. (This means faithful digital conversion of analog inputs is not possible.)

The ABC circuit to be explained next takes advantage of this fact; i.e., the reference voltage is varied according to the A-D conversion circuit output signal level to vary the dynamic range, thereby canceling the background density of originals. (This processing is executed for every main scanning line.)

Outline of A-D conversion



Ⓐ : Dynamic range of a white original.

Ⓑ : Dynamic range of a colored background.

Figure 3-303

b. ABC (auto background control) Circuit

The ABC circuit operates if 'priority to speed' is selected as part of AE (auto density mechanism) settings; image signals after A-D conversion are returned to the ABC circuit for the following processing.

- Identifies the A-D conversion circuit output signal level.
- Varies the reference voltage based on the results of identification.

The reference voltage obtained here is sent to the A-D conversion circuit. The "priority on speed" function may be adjusted in service mode (*3*); see p. 3-204

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C. Digital Image Processing

1. Outline

The digital image processing block serves to process image signals from various functions boards. See Figure 3-304 for a block diagram of various image processing functions:

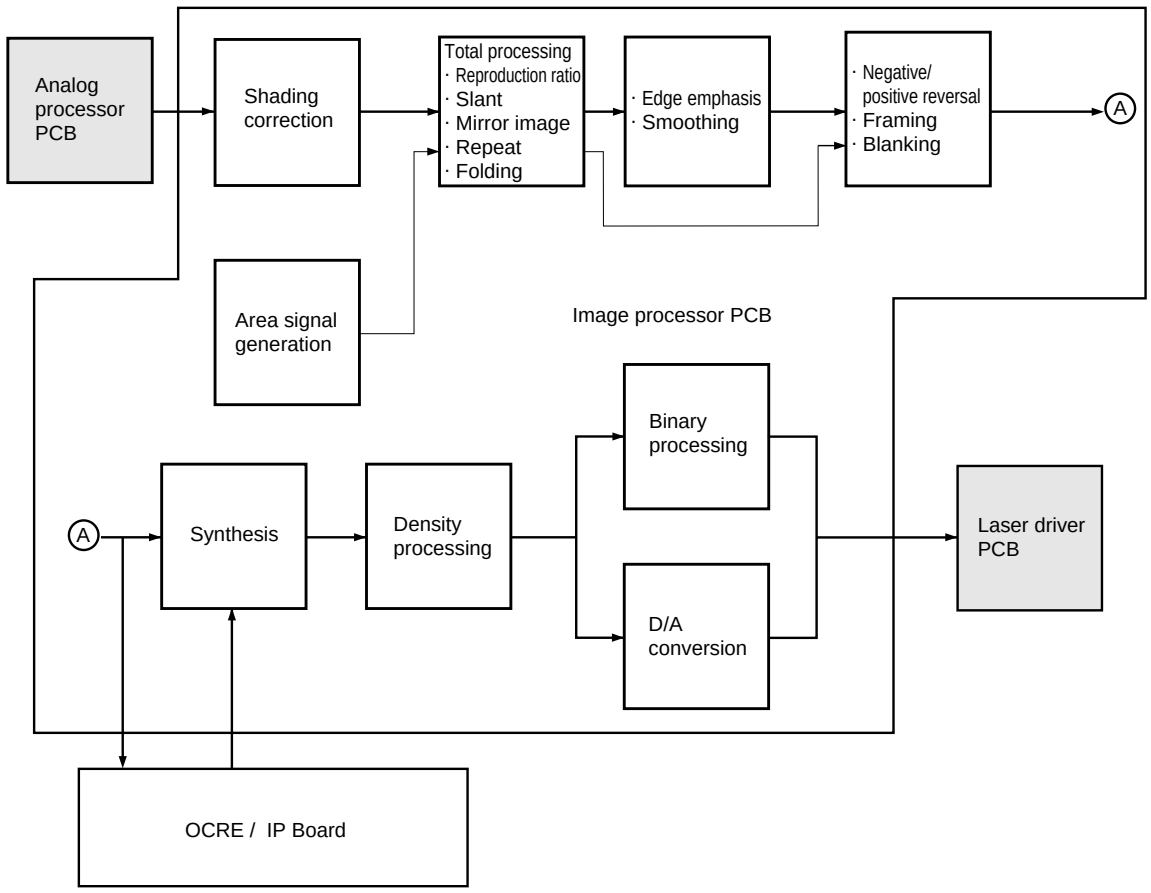

Figure 3-304

2. Shading Correction

The output of the CCD will not be constant for the following factors even when the light reflected by an original with even density is projected to the CCD.

1 The sensitivity of each pixel of the CCD is not the same.
2 The degree of transmission of the lens is different between the center and the sides.
3 The intensity of the scanning lamp is different between the center and the sides.
4 The scanning lamp can deteriorate.

Shading correction is performed to correct the above discrepancies. Shading correction may be executed for each copy or executed automatically according to the target value determined in service mode.

a. Shading Automatic Correction

Shading automatic correction is executed by using service mode (*4*; FUNCTION).

In this type of correction, the density of blank paper and the standard white plate is measured and stored in memory. The stored data is subjected to computation and used as the “target value” for shading correction.

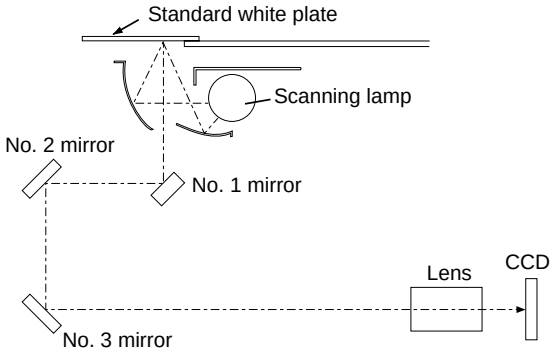

Figure 3-305

b. Shading Correction

Shading correction is executed for every scanning of an original.

In this type of correction, the light of the scanning lamp is directed to the standard white plate (Figure 3-305), and the reflected light is turned into digital signals by the analog image processing block. The reflected light data which has been turned into digital signals are sent to the shading circuit of the image processor PCB.

The shading circuit compares the pre-determined target value and shading data and sets the difference as the shading correction value.

The shading correction value is used to correct variations among CCD pixels occurring at time of scanning and to ensure a specific image density level.

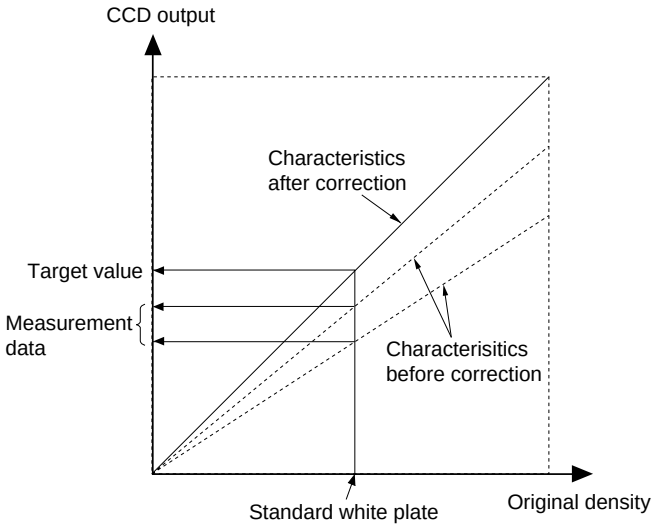

Figure 3-306

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2. Total Processing

The total processing block deals with the following:

- Reproduction ratio
- Shift
- Mirror image
- Slanting
- Repeat
- Folding

a. Reproduction Ratio

① Horizontal Reproduction Ratio (main scanning direction)
When writing image data into memory, data units may be skipped for reduction; when reading them from memory, they are read a multiple number of times (enlargement).

② Vertical Reproduction Ratio (sub scanning direction)
The speed at which the scanner is moved is varied so as to change the width of scanning an original.
Table 3-302 gives an idea of how the GP215/GP200 processes reproduction ratios.

③ Zoom Fine-Adjustment
You can adjust the vertical or the horizontal reproduction ratio using zoom adjustment in user mode (in 0.1% increments).

For instance, for 'adjustment width' +1% (both X and Y),
50% → 51%
100% → 101%
400% → 401%

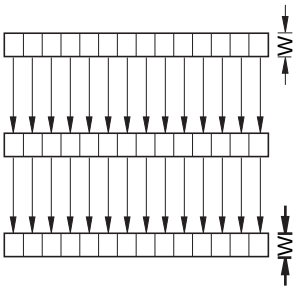
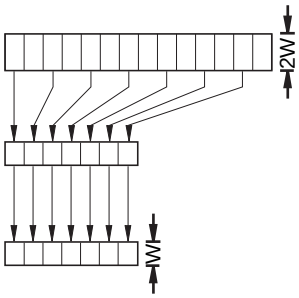
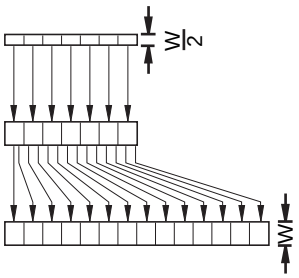
	Direct	Reduce	Enlarge
Original (image data) (writing) Line memory (reading) Copy			
Reproduction ratio in main scanning direction	All data is written as it is into memory.	To reduce to 1/2, every other data unit is skipped when writing into memory.	To enlarge to 200%, all data units are written as they are but read twice when reading from memory.
Reproduction ratio in sub scanning direction		The speed at which the scanner is moved is increased, thereby increasing the width of scanning the original in relation to a single pixel.	The speed at which the scanner is moved is decreased, thereby decreasing the width of scanning the original in relation to a single pixel.

Table 3-302

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b. Shift Processing

Figures 3-309, -310, and -311 give samples of image shifting and conceptual outlines of shifting in main/sub scanning direction.

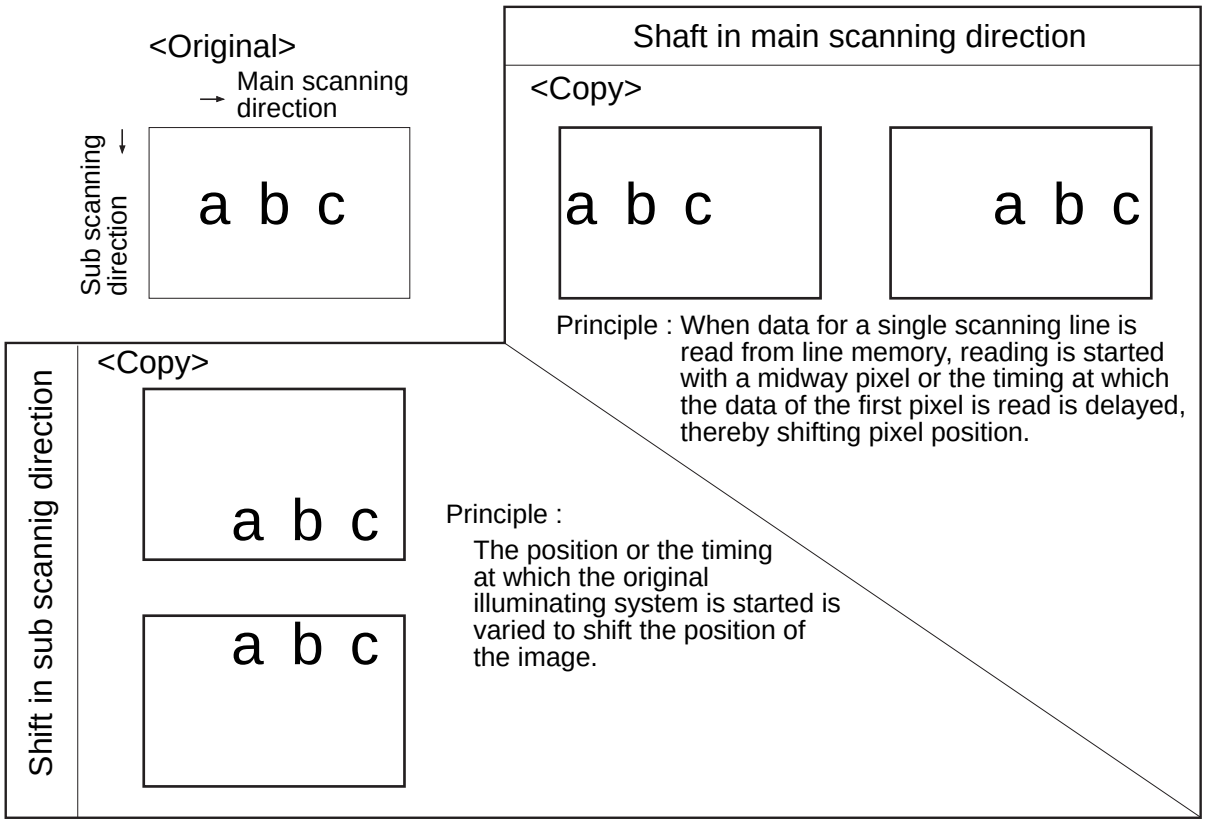
<Original>
Main scanning direction
Sub scanning direction
a b c
Shaft in main scanning direction
<Copy>
a b c
a b c
Principle : When data for a single scanning line is read from line memory, reading is started with a midway pixel or the timing at which the data of the first pixel is read is delayed, thereby shifting pixel position.
Shift in sub scannig direction
<Copy>
a b c
a b c
Principle :
The position or the timing at which the original illuminating system is started is varied to shift the position of the image.

Figure 3-309

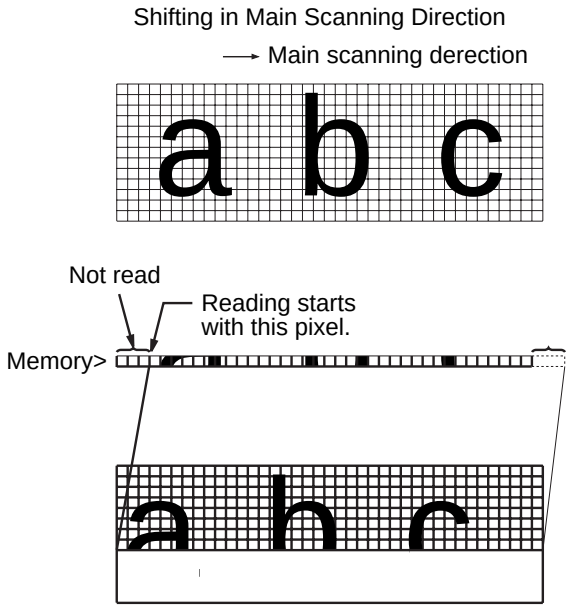

Figure 3-310

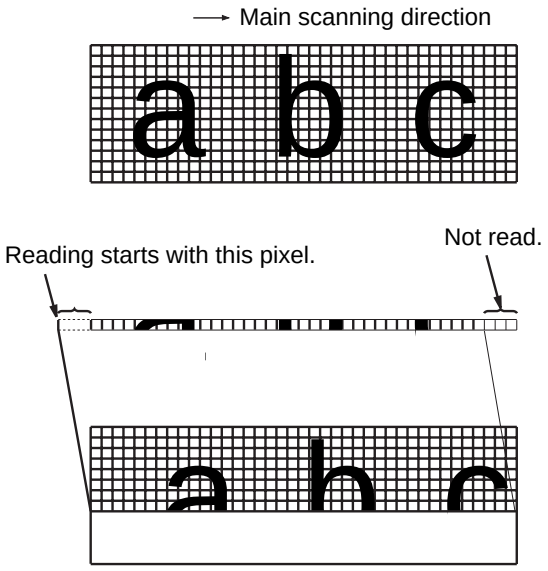

Figure 3-311

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The image of an original may be shifted as follows by combining shifts in main and sub scanning directions.

① Corner Shift
The coordinates (X1, Y1) of the corner of a specific area is moved to any of the four corners of the copy.

② Center Shift
The coordinates (Xm, Ym) are computed from the size of the area to be shifted and the size of the copy so that the margins at the top and bottom and left and right will be identical; the area will be moved to X1 and Y1.

Reference:

$$Xm = \frac{Xmax-(X2-X1)}{2}$$

$$Ym = \frac{Ymax-(Y2-Y1)}{2}$$

③ Free Shift
The coordinates (X1, Y1) of a specific area is moved to a specific point (Xp, Yp).

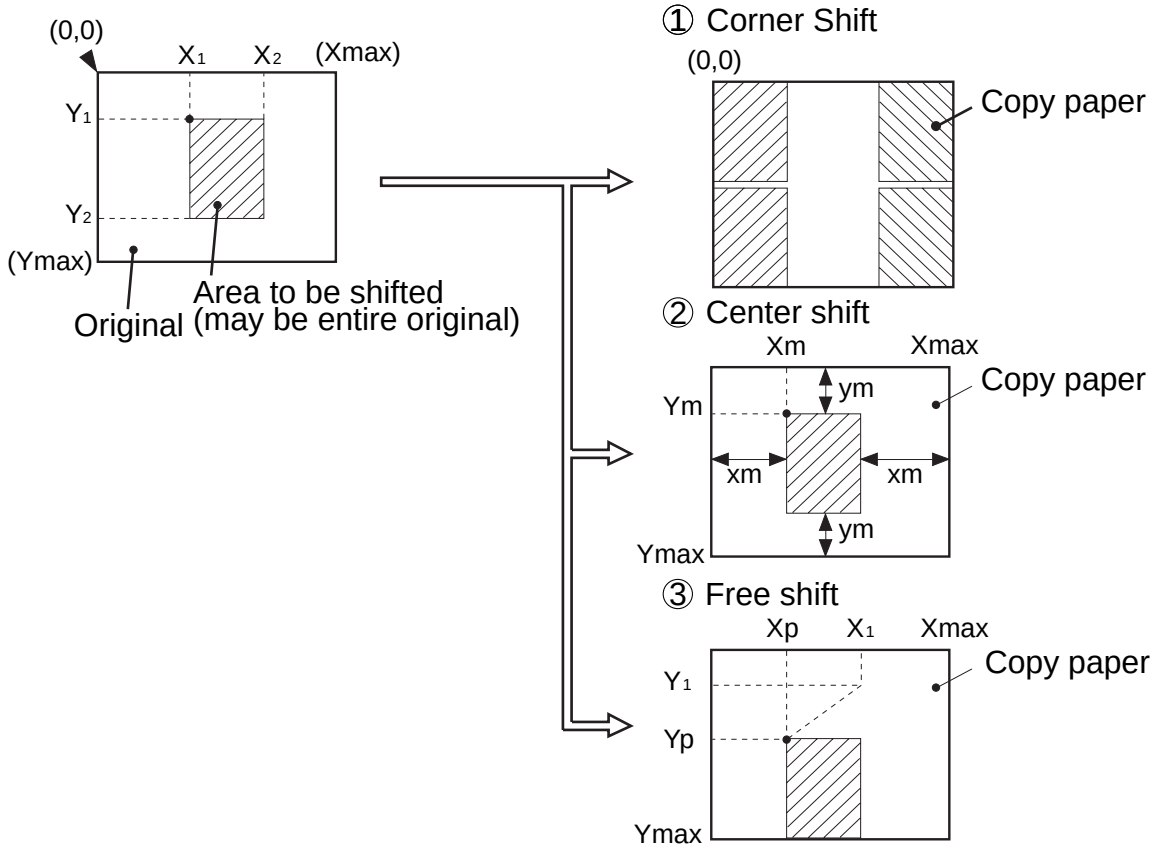

Figure 3-312

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c. Reduced Image Composition

Reduced image composition mode may be any of the following two:

① 2-on-1 mode, in which two originals are reduced for copying on a single sheet of copy paper.

② 4-on-1 mode, in which four originals are reduced for copying on a single sheet of copy paper.

Executing these modes requires control under combination of reproduction ratio processing, shift processing, and overlay processing.

In reproduction ratio processing, a reproduction ratio is computed based on the size of the original and the size of the copy.

- Formula for Lengthwise Direction
  a: copy paper length ÷ (original length × 2)
  b: copy paper length ÷ original length
- Formula for Breadthwise Direction
  c: copy paper width ÷ (original width × 2)
  d: copy paper width ÷ original width

If the reproduction ratio in lengthwise direction and that in breadthwise direction are different, the smaller of the two will be selected; however, the reproduction ratio will be between 25% and 800%.

Shift processing and overlay processing are controlled as explained in the next page. See Table 3-303 to find out what modes are available in relation to different combinations of the RDF and the duplexing unit.

Mode	Duplexing unit	RDF	Lengthwise ratio	Breadthwise ratio
2-on-1 (overlay)	Required	Not Required	b	c
2-on-1 (continuous)	Not Required	Required	a	d
2-on-1 (two-sided)	Required	Required	a	d
4-on-1	Not Required	Not Required	a	c

Table 3-303

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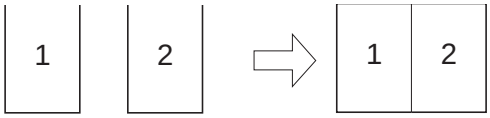
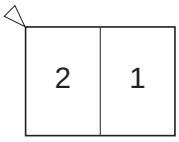
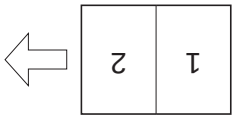
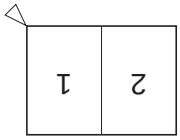
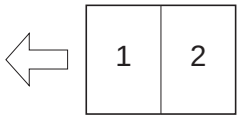
2-on-1 mode (continuous, two-sided)	Original (A4 x 2)		Copy (A4R x 1)
			
Mode	Orientation of originals on copyboard glass	Image after copying (arrow indicating feeding direction)	Remarks
• Book mode • RDF in use	Original  Two originals are placed on the copyboard side by side.	Copy paper 	• Executed in reduced copying only. • May be executed for two-sided copying. • Uses the RDF's reversing function when feeding originals, thereby changing the order of the originals (making it [2][1] instead of normal [1][2]).
• ADF in use	Original  Two originals are placed on the copyboard side by side.	Copy paper 	• Executed in reduced copying only. • May be executed for two-sided copying. • Since the ADF does not have an original reversing function, the order of originals cannot be changed. As such, the orientation of the originals on the ADF's original tray is reversed (← [A] instead of normal ← [∀]).

Figure 3-313 2-on-1 Mode (continuous, two-sided)

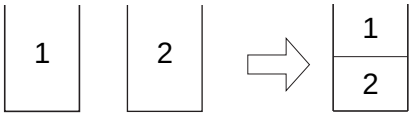
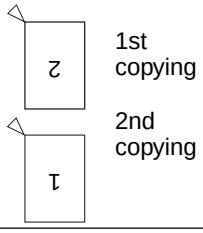
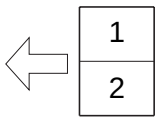
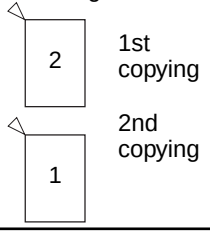
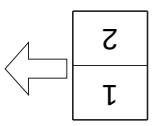
2-on1 (overlay)	Original (A4 x 2)		Copy (A4R x 1)
			
Mode	Orientation of originals on copyboard glass	Image after copying (arrow indicating feeding direction)	Remarks
• Book mode • ADF in use	Original  1st copying 2nd copying	Copy 	Combines the following: • Reduced copying • Image shifting • Overlay copying
• RDF in use	Original  1st copying 2nd copying	Copy 	Combines the following: • Reduced copying • Image shifting • Overlay copying

Figure 3-314 2-on-1 Mode (overlay)

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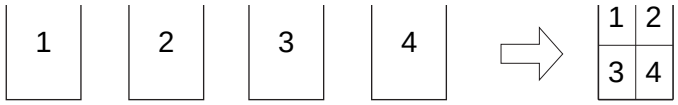
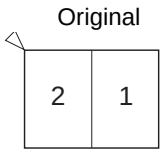
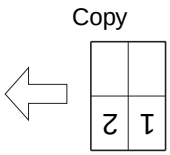
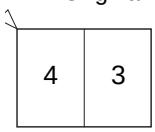
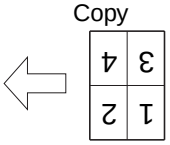
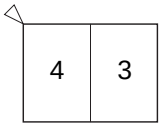
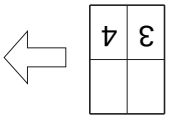
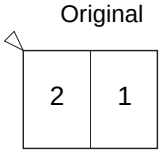
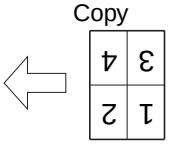
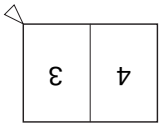
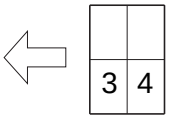
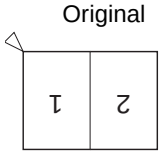
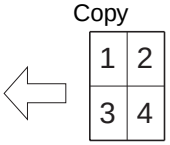
4-on-1	4 originals (A4)			1 copy (A4)
				
Mode	Copying	Orientation of originals on copyboard	Image after copying (arrow indicating feeding direction)	Remarks
• Book mode	1st copying			• Combines the following: • Reduced copying • Image shifting • Overlay copying
	2nd copying			
• RDF in use	1st copying			Combines the following: • Reduced copying • Image shifting • Overlay copying Uses the RDF's reversing function when feeding originals, thereby changing the order of the originals (making it [4 3] [2 1] instead of normal [3 4] [1 2]).
	2nd copying			
• ADF in use	1st copying			Combines the following: • Reduced copying • Image shifting • Overlay copying • Since the ADF does not have an original reversing function, the order of originals cannot be changed. As such, the orientation of the originals on the ADF's original tray is reversed (← [A] instead of normal ← [∀]).
	2nd copying			

Figure 3-315 4-on-1 Mode

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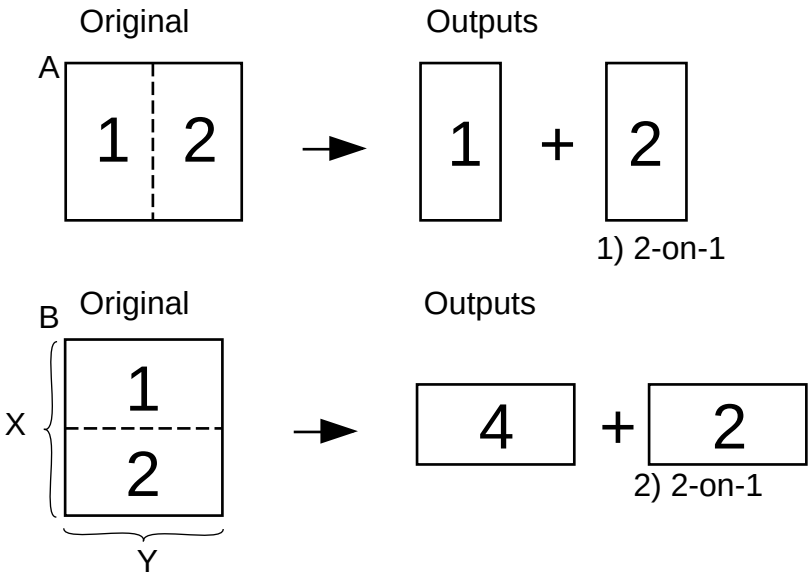
d. Enlarged Image Composition

In enlarged image composition, the reduced image of an original is returned to its original size; it may be any of the following four:

- 2-on-1, generating 2 outputs
- 2-on-1 two-sided, generating 4 outputs
- 4-on-1, generating 4 outputs
- 4-on-1 two-sided, generating 8 outputs.

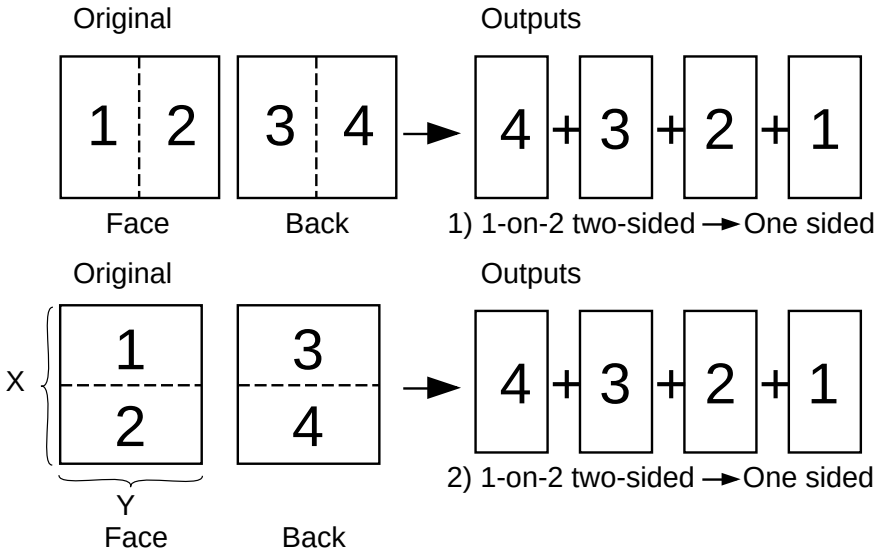
① 2-on-1, Generating 2 Outputs



- The image (original width) of continuous 2-on-1 is divided vertically for output.
- The image (original length) of continuous 2-on-1 is divided horizontally for output.
- Originals may be placed on the copyboard or in the RDF-G1 (not ADF-F1).

Figure 3-316

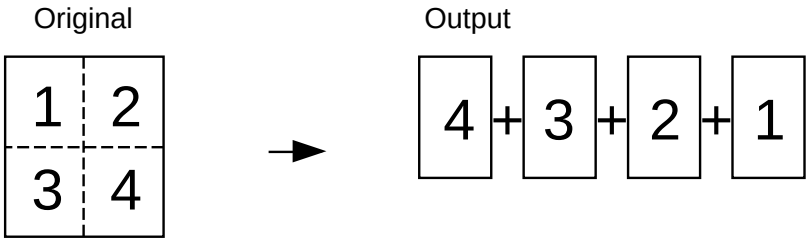
② 2-on-1 Two-Sided, Generating 4 Outputs



- The image (original width) of continuous 2-on-1 is divided vertically for output.
- The original (original length) is divided horizontally for output.

Figure 3-317

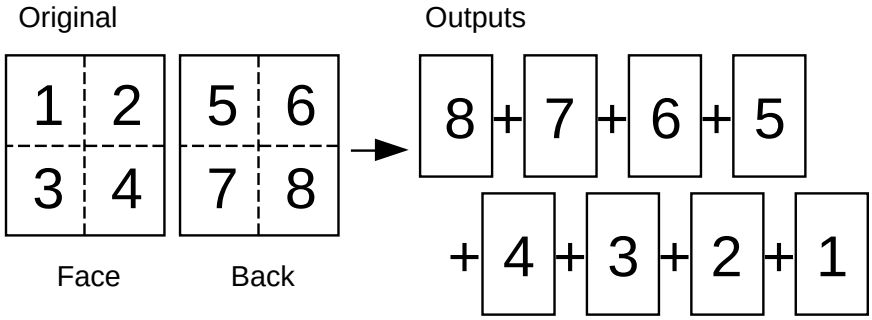
③ 4-on-1, Generating 4 Outputs



- No number of effective areas of the last original is specified; i.e., if section 4 of the original is blank, output 4 will be blank.

Figure 3-318

④ 4-on-1 Two-Sided, Generating 8 Outputs



- No number of effective areas of the last original is specified; i.e., the same as in the case of 4-on-1, generating 4 outputs.

Figure 3-319

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e. Mirror Image

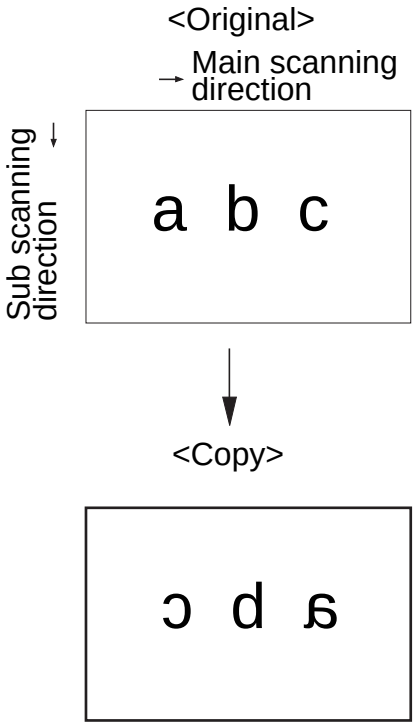

Figure 3-320

■ Principle

When reading data for a single scan from RAM, the order of reading is reversed, thereby creating mirror images in relation to main scanning direction.

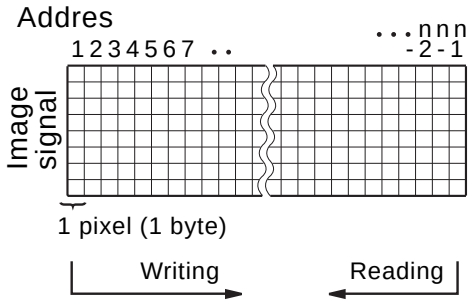

Figure 3-321

f. Image Repeat

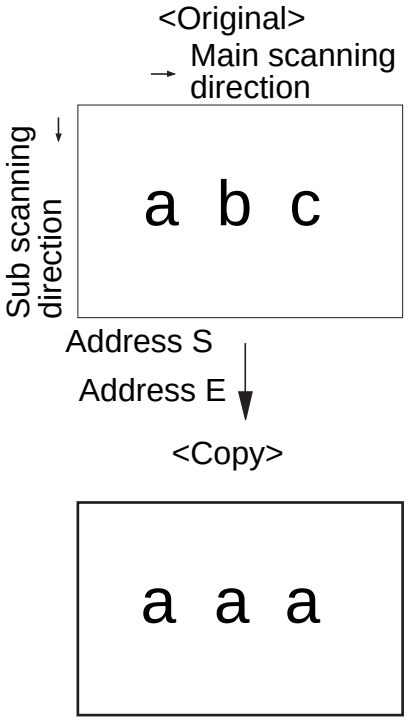

Figure 3-322

■ Principle

When reading data for a single scan from RAM, a start address (address S) and an end address (address E) are specified for reading. Then, reading is started at address S; when address E is reached, a return is made to address S. A specific image is repeated by repeating these operations.

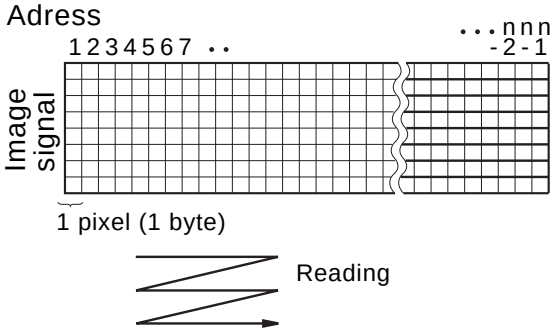

Figure 3-323

g. Repeat

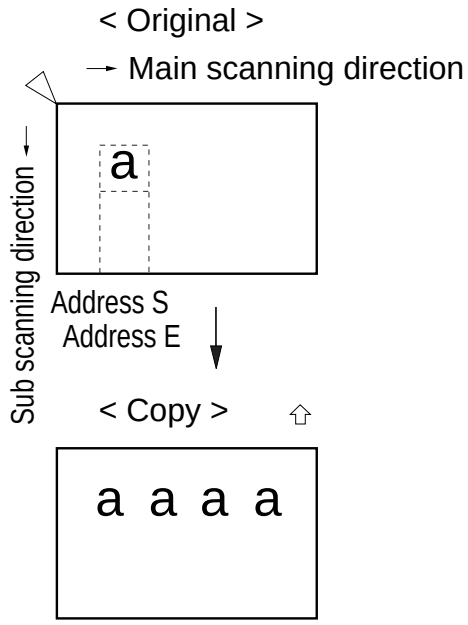

Figure 3-324

■ Principle

When reading data for a single scan from RAM, a start address (address S) and an end address (address E) are specified. Then, reading is started at address S; when address E is reached, a return is made to address S. A specific image is repeated by repeating these operations.

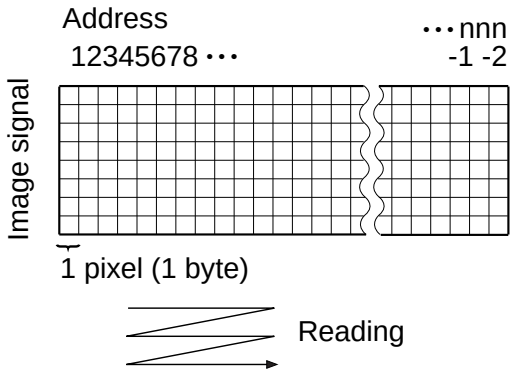

Figure 3-325

h. Slant

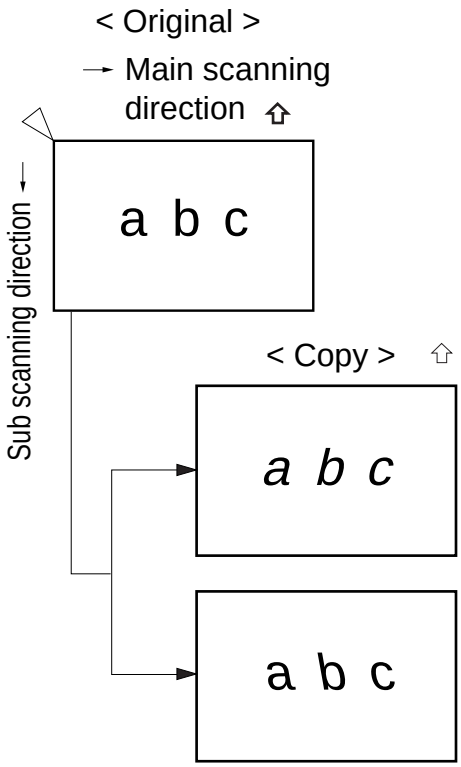

Figure 3-326

■ Principle

When reading data for a single scan from RAM, the start address is shifted for each reading, thereby slanting the image.

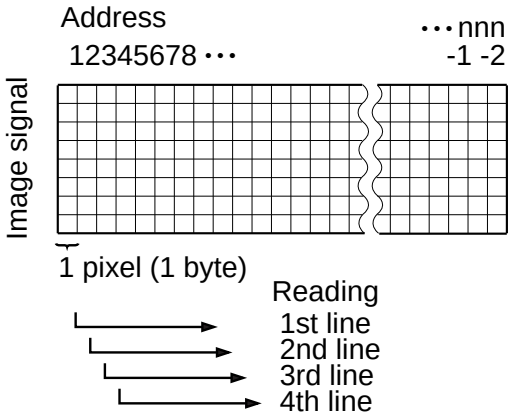

Figure 3-327

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4. Sharpness/Filter Processing

a. Sharpness/Filter Processing

In sharpness/filter processing, computations are performed so that a crisp or soft image may be obtained as specified on the control panel.

Figure 3-328b shows the output level occurring as the result of selecting ‘sharpness mode weak’ for the image data shown in Figure 3-328a.

In ‘sharpness mode weak’, the variations in the density of an image are smoothed out to generate a soft image. (The effect may be used to make moire less conspicuous.)

Figure 3-328c shows the output level occurring when ‘sharpness mode strong’ is selected.

In ‘sharpness mode strong’, the variations in the density of an image are emphasized to generate a crisp image.

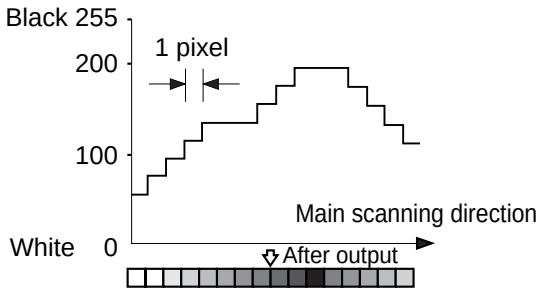

Figure 3-328a

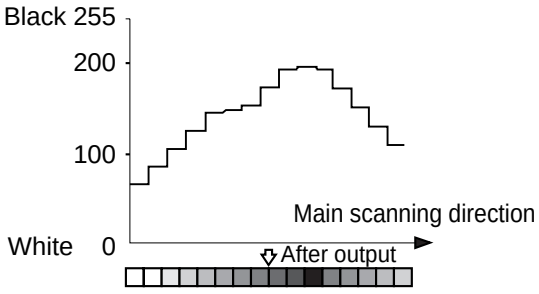

Figure 3-328b Sharpness Mode Weak

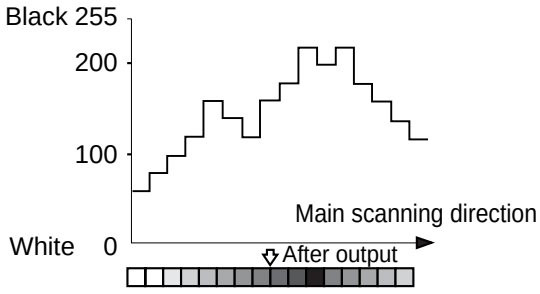

Figure 3-328c Sharpness Mode Strong

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b. AI Outline processing

AI outline processing emphasizes the edges of characters.

When image data input is as shown in Figure 3-329, the CPU assumes the presence of characters and initiates outline processing.

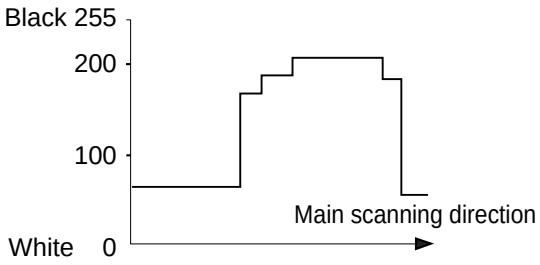

Figure 3-329 Image Data of Characters

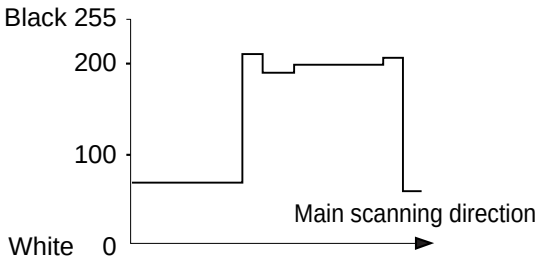

Figure 3-330 Image Data of Characters after Outline Processing

When image data input is as shown in Figure 3-331, the CPU assumes the presence of a photo and does not initiate outline processing.

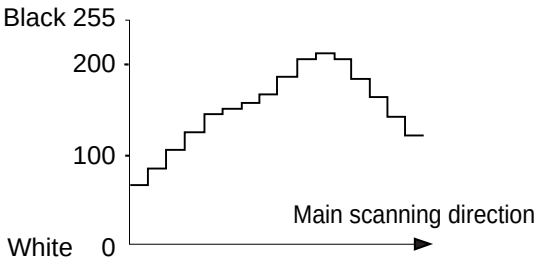

Figure 3-331 Image Data of a Photo

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5. Negative/Positive Reversal

The negative/positive reversal circuit executes the following image processing:

- Negative/positive reversal
- Framing
- Blanking
- Pasting

a. Negative/Positive Reversal

Level conversion is executed so that the white area of an original will be black and the black area will be white on copies.

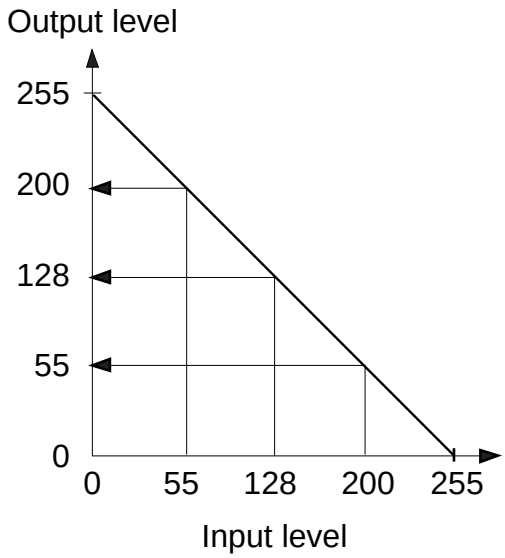

Figure 3-332 (concept of level conversion)

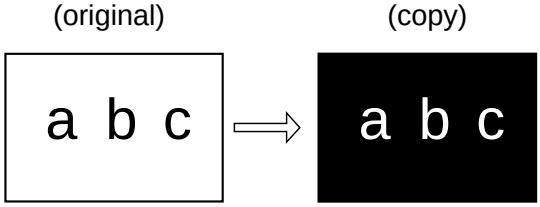

Figure 3-333

b. Framing/Blanking

For framing/blanking, areas may be as many as 4 areas; for a rectangle, as many as 10 points may be specified.

■ Framing

The signals representing non-specified areas are forced to represent white.

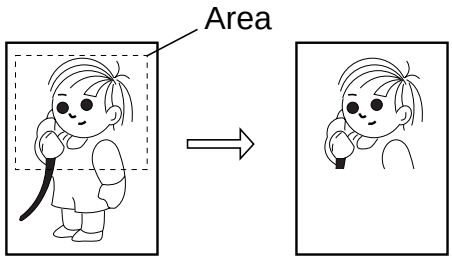

Figure 3-334 Framing

■ Blanking

As opposed to framing, the signals representing the specified area are forced to represent white.

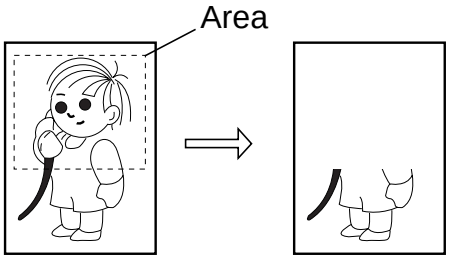

Figure 3-335 Blanking

e. Pasting

This function may be used when the Retention Memory Unit (option) is installed. Images stored in the retention memory in advance and the image on the copyboard glass are synthesized for output.

6. Density Processing

a. Logarithmic Correction

The CCD output has linear characteristics in relation to the light reflected by an original. However, the density of an original as perceived by the human eye does not show linear characteristics in relation to the light reflected by the original.

The relationship between the density as perceived by the naked eye and the output of the CCD are as shown in Figure 3-336.

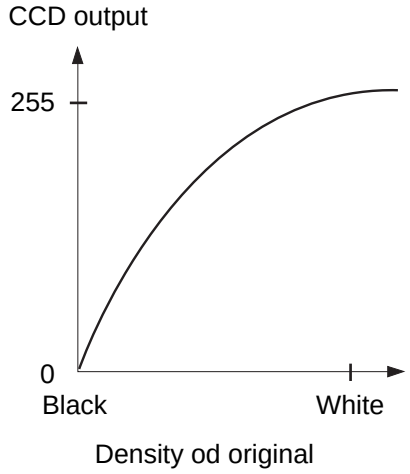

Figure 3-336

To correct the discrepancy, the correction curve shown in Figure 3-337 is used to execute level conversion.

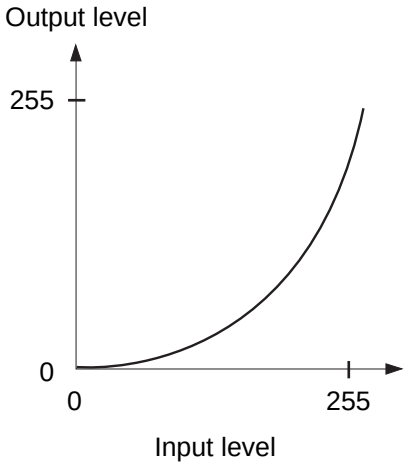

Figure 3-337

b. Density Processing

The correction curve for density processing varies according to the following:

1) Setting of the Copy Density key on the control panel.
2) Results of AE measurement
3) Selection of text/photo, photo mode
4) Results of photosensitive drum resistance

According to the setting of the Copy Density key, the curve will be for darker or lighter as in Figure 3-338.

When text/photo or photo mode is selected, the curve shown in Figure 3-339 will be selected to ensure good gradation and faithful reproduction of the density of an original.

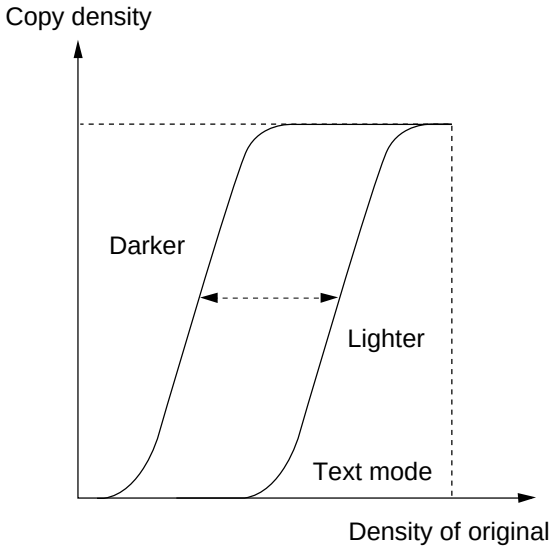

Figure 3-338

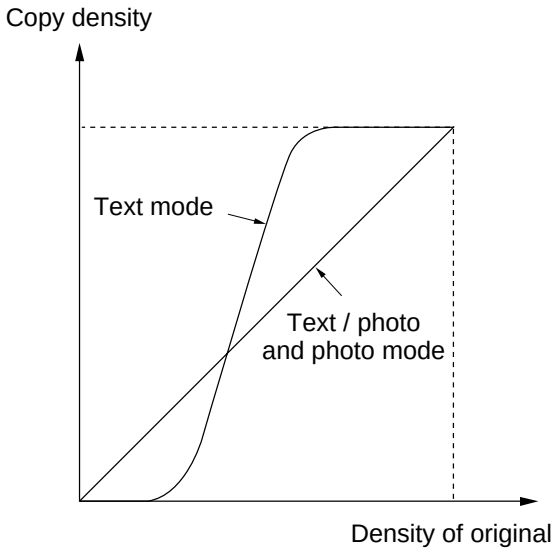

Figure 3-339

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The GP215/GP200's AE may be 'priority on speed' (default) or 'priority on image quality'. (Here, the discussions are on 'priority on image quality'; for 'priority on speed', see p. 3-32.)

In 'priority on image quality', the density correction curve is varied according to the type of original.

In 'priority on image quality', the scanner is moved forward to suit the size of the detected original, thereby executing full scanning for measuring the density of the entire original.

This way, the density of the background and the density of the image are measured to classify the original into any of the following three types:

① Background Type Original
Originals which are white or light in density carrying text.

② Reversal Type Original
Originals which are colored or light in density carrying light text or reversed text.

③ Other Originals
Originals with little variation in density (e.g., photos).

Depending on the type of original, one of the following three AE tables is selected to generate a correction table to suit the original for density correction.

You may adjust the "priority on image" function in service mode (∗3∗); see p. 3-205

When AE is executed using the ADF or the RDF, AE is initiated for each original which is picked up.

In page separation, a signal AE scan is used to check the density of all originals for the selection of an AE table.

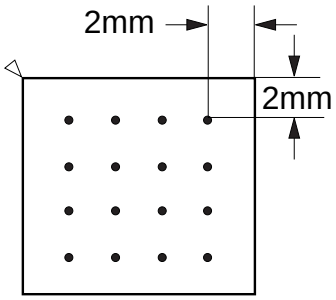
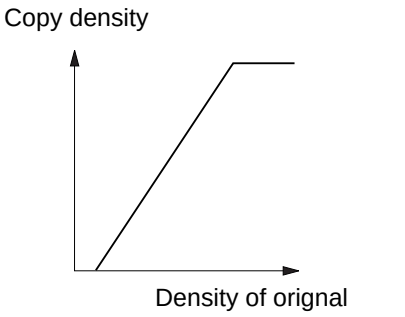
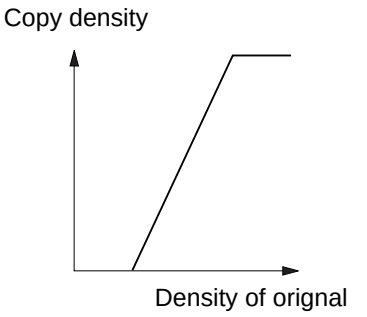


Figure 3-343 Points of AE Measurement



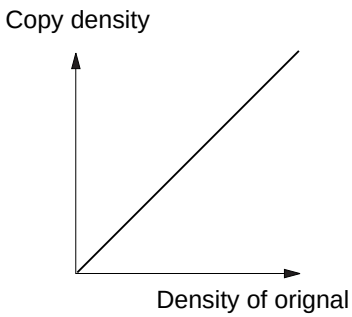
AE Table for Background Type

Figure 3-340



AE Table for Reversal Type

Figure 3-341



AE Table for Other Type

Figure 3-342

7. Binary Processing

The binary processing circuit converts multiple-value image signals into binary signals. The method used here is called the PD method, which enables better reproduction of highlight areas than the median density (MD) retention method.

Binary processing is executed in text mode and text/photo mode.

8. D-A Conversion

The D-A conversion circuit is used to convert multiple-value image signals into analog signals. D-A conversion is executed in photo mode

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IV. LASER EXPOSURE SYSTEM

A. Laser Processing Assembly

1. Outline

The major components of the laser unit include a laser unit, which serves as the source of laser beams, a laser scanner motor, which is equipped with a 6-facet mirror, and a BD detection PCB, which serves to detect laser beams.

The laser beam generated by the laser unit is directed to the 6-facet mirror rotating at a specific speed. The laser beam reflected by the 6-facet mirror is moved through the imaging lens and its optical path is bent by the laser mirror before it reaches the photosensitive drum. While all this is taking place, the laser beam is bent to an acute angle by the BD mirror located inside the laser scanner unit for the BD detection PCB. (Figure 3-401B)

When the 6-facet mirror rotates at a specific speed, the laser beam scans the surface of the photosensitive drum at a specific speed to remove charges and, as a result, to form a latent image.

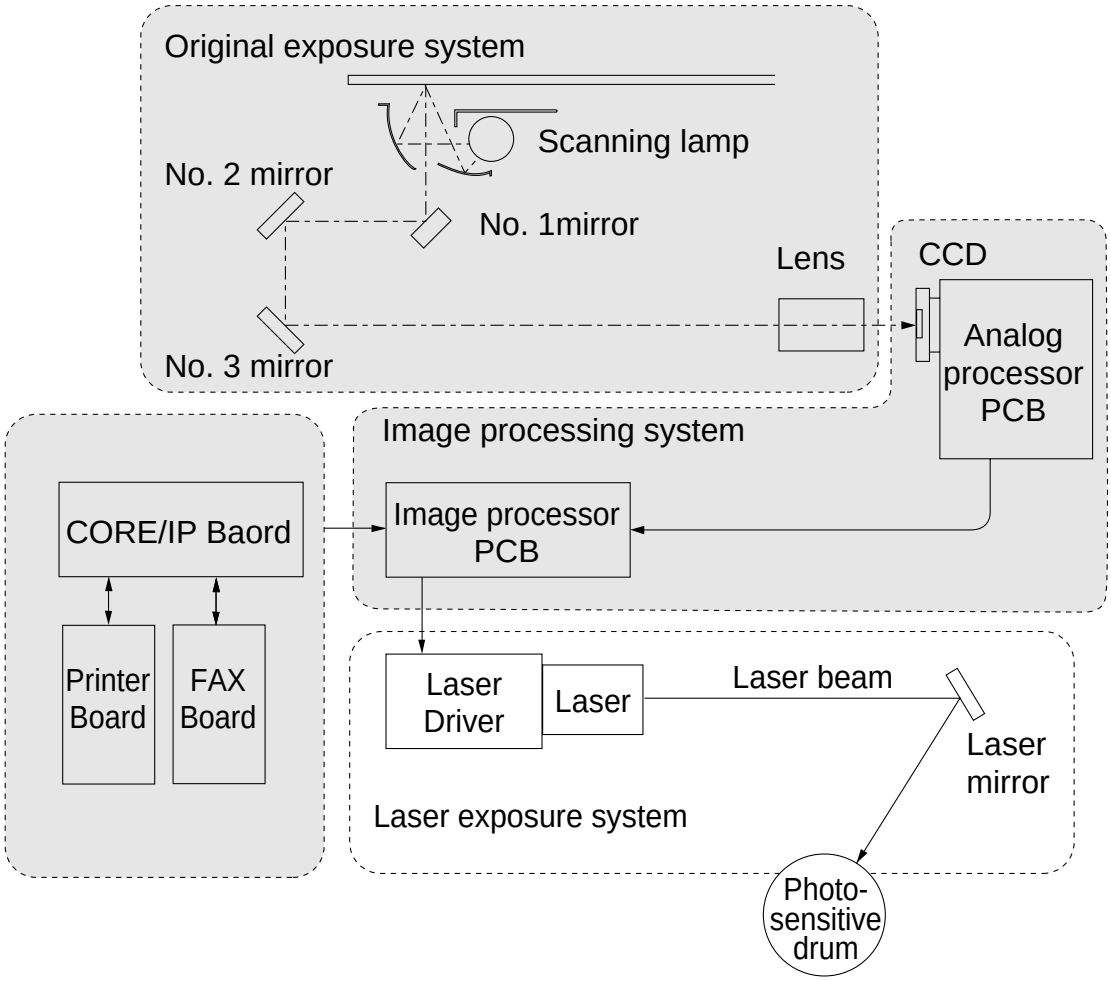

Figure 3-401A

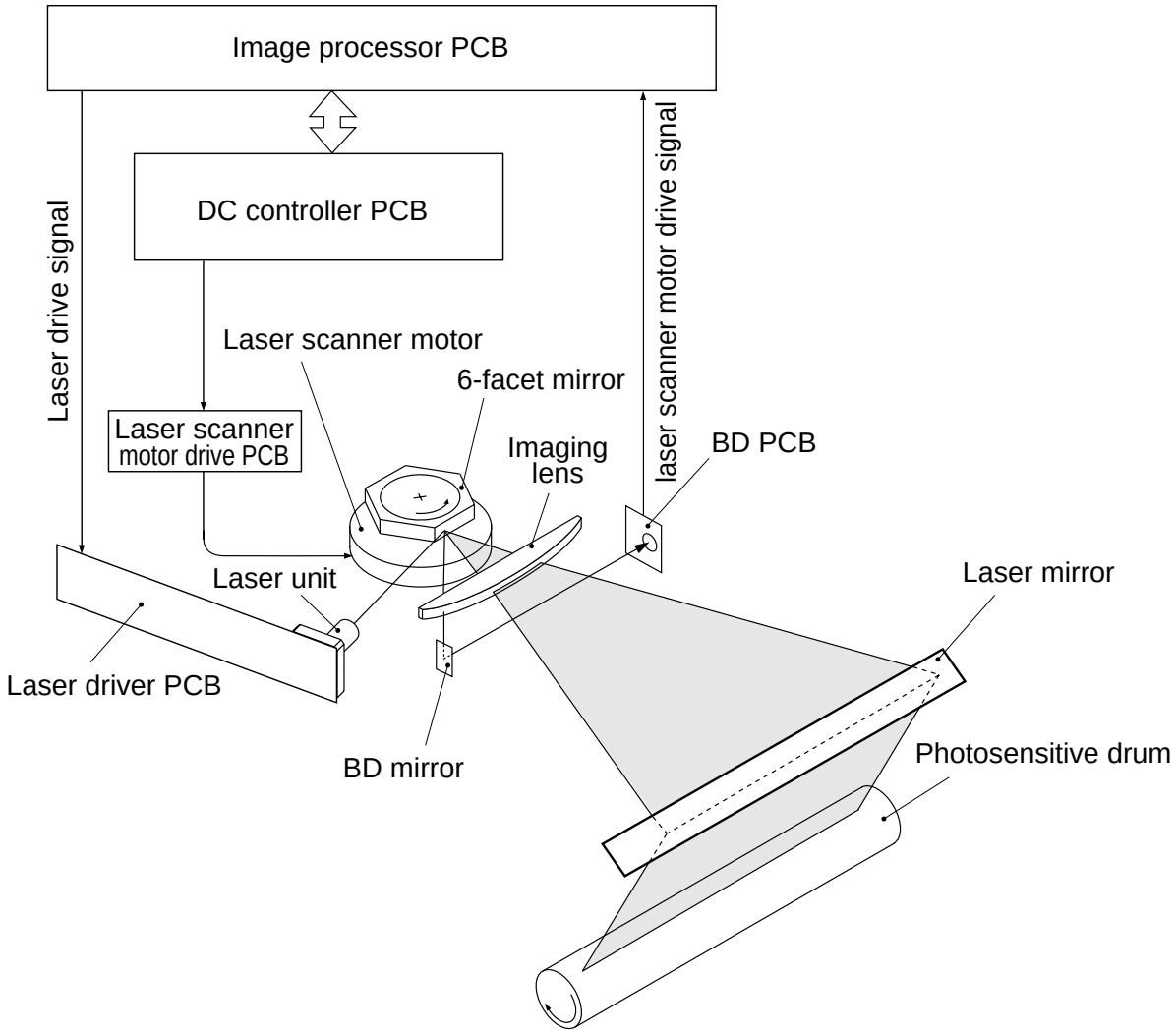

Figure 3-401B

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B. Generating the BD Signal

A laser ON signal (horizontal sync signal) is needed when directing a laser beam to the photosensitive drum, and the laser beam detection signal (BD) is used to generate such a start signal.

The GP215/GP200 is designed to detect the edge of copy paper which has been re-picked up for two-sided/overlay copying to measure the discrepancy, if any, toward the rear/front.

Using the result of this measurement, the laser ON timing is varied in relation to the BD signal to ensure that the image will be at a specific position on every copy. For details on how the end of copy paper is detected, see p. 3-114.

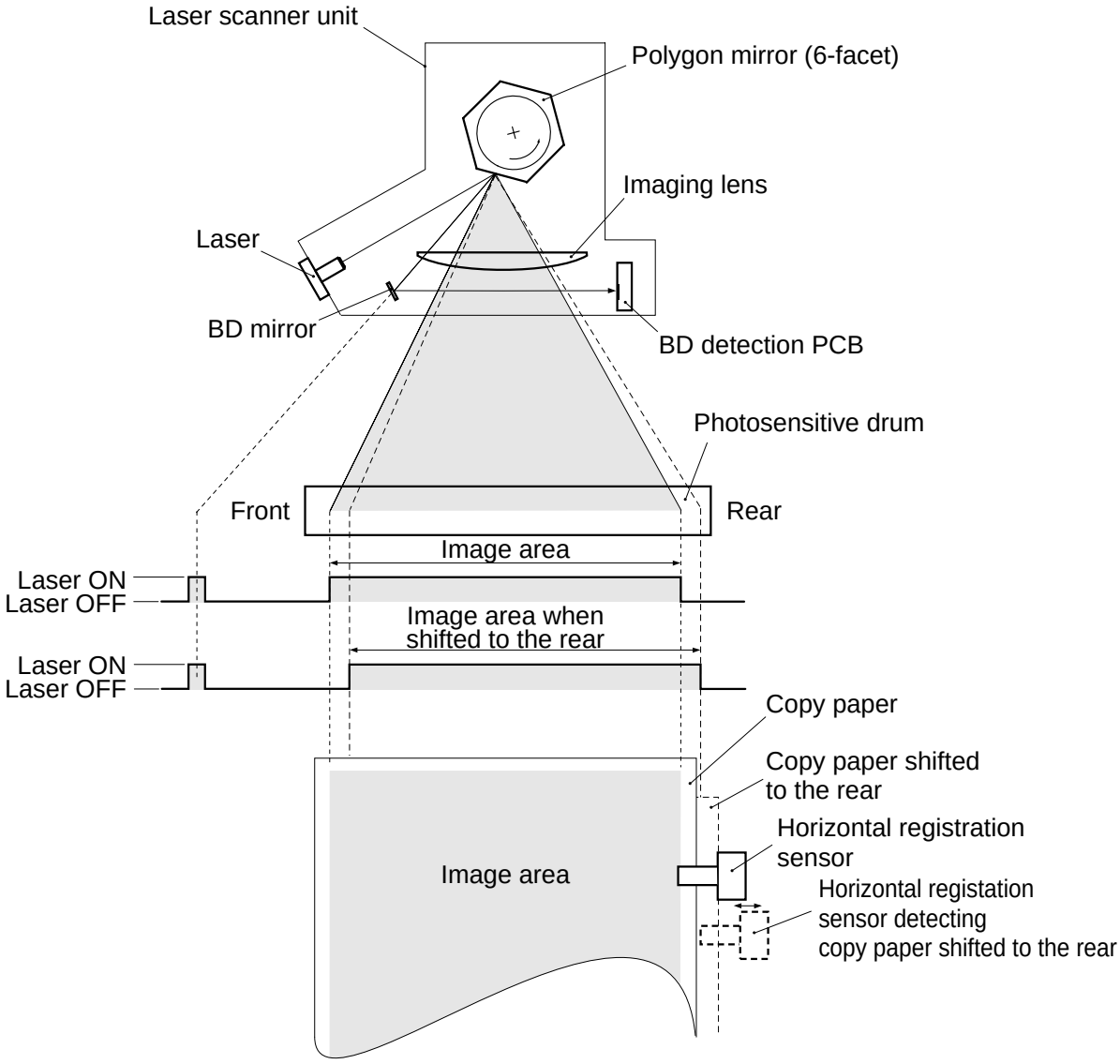

Figure 3-402

C. Laser Driver Circuit

1. Operation

The optical output of the laser (semiconductor laser) is affected largely by changes occurring in the ambient temperature. The GP215/GP200 uses a control mechanism which varies the laser drive current automatically to suit the ambient temperature, thereby ensuring a specific output.

When the Copy Start key is pressed, the image processor PCB sends the bias control signal (APCON*) and the laser drive signal (LSRD) to the laser driver PCB so as to drive the bias control circuit and the constant current circuit on the laser PCB, thereby turning ON the laser beam.

The laser beam is detected by the pin photodiode (PD) built into the laser element, and the PD photo output voltage is returned to the bias control circuit.

The photo output voltage is sample-held and compared against the reference voltage from the laser intensity setting circuit, thereby determining the value of the laser bias current. This laser bias current is varied continuously in conjunction with the changes in temperature to ensure a specific output. (Figure 3-404)

A series of these operations is executed for each signal line of scanning.

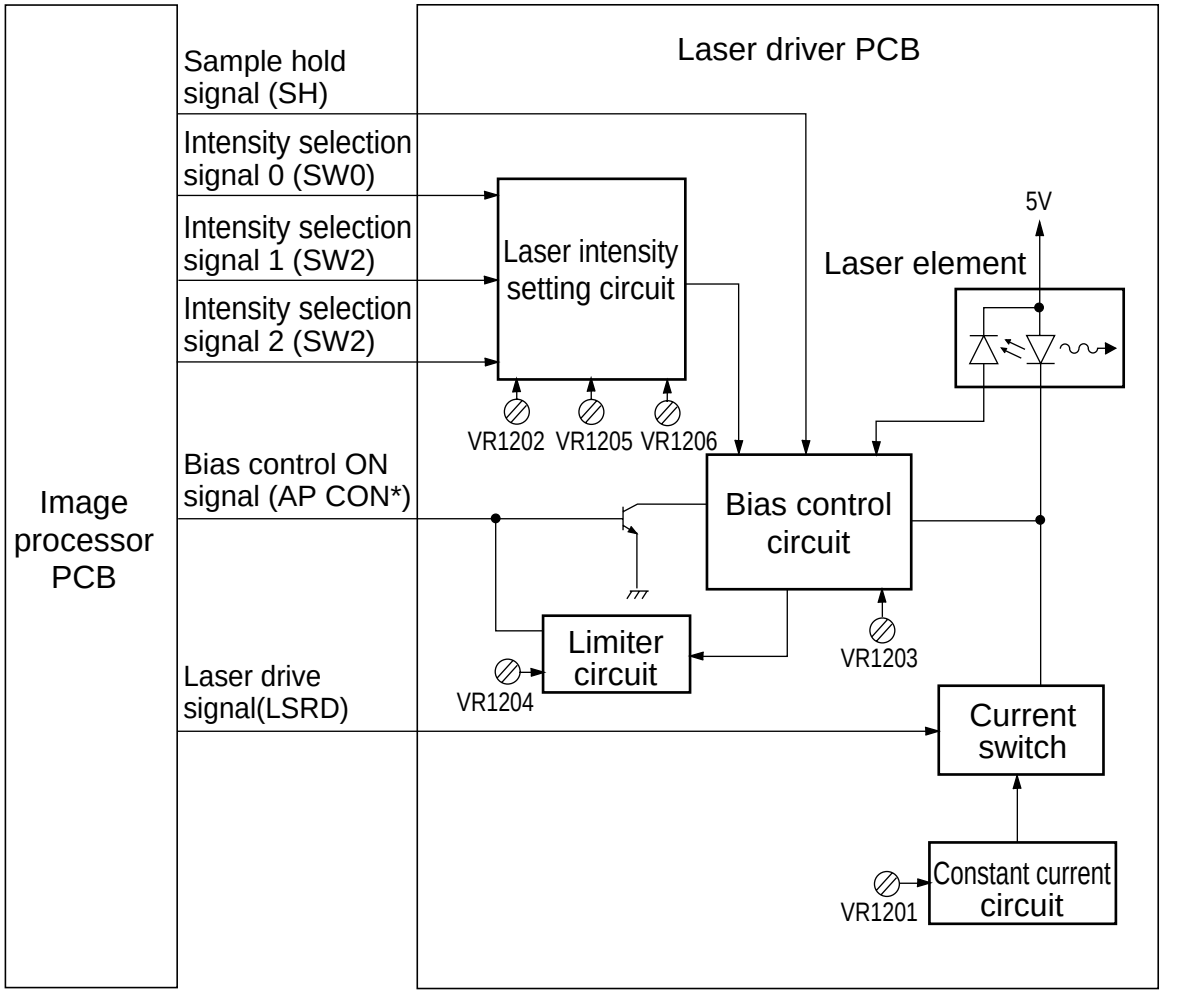

Figure 3-403

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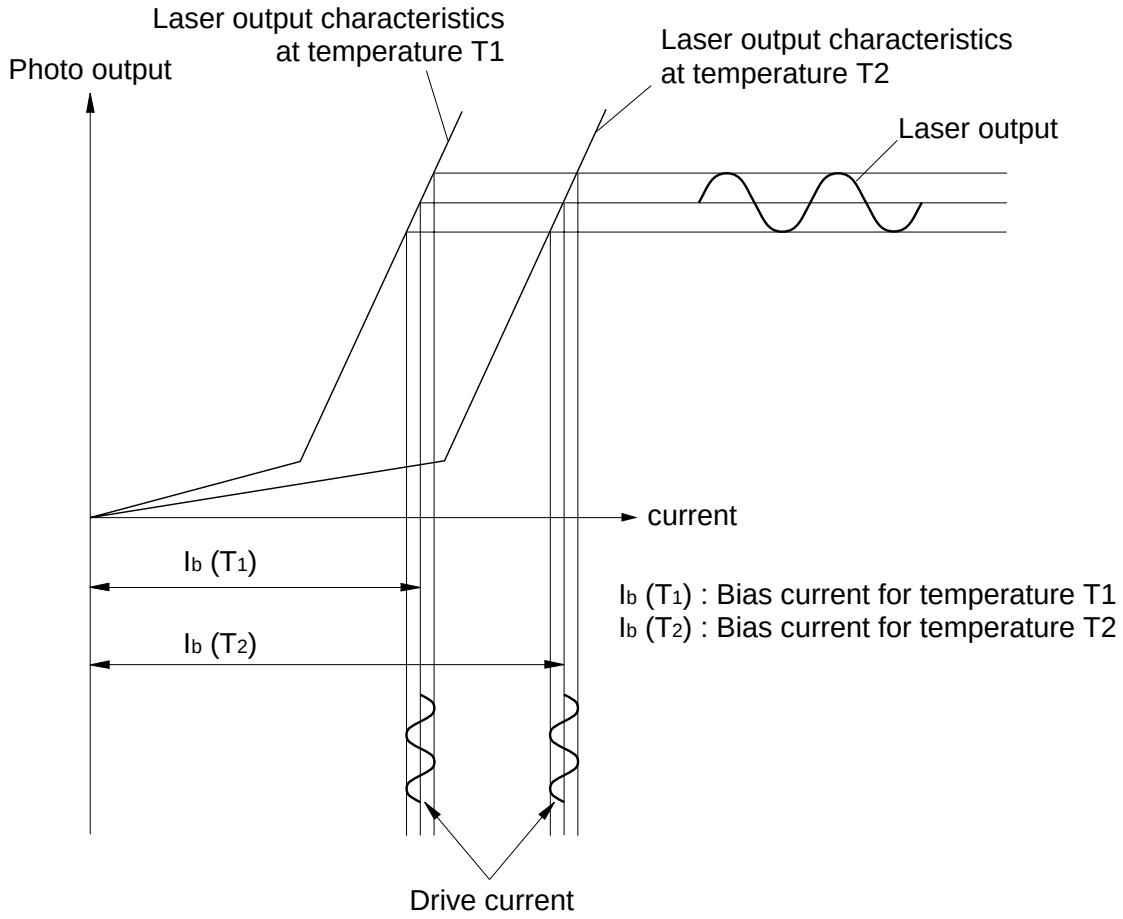

Figure 3-404

2. Switching the Laser Output

The laser output may be either high, medium, or low, ensuring the best image for the selected mode. The output is switched by the output signal “intensity selection signal 0, 1, 2” from the image processor PCB.

Each of these laser outputs is used for its respective mode as shown:

Laser output	Mode
High	Text mode, text/photo mode
Medium	Photo mode, FAX output
Low	Printer output

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D. Controlling the Laser Scanner Motor

1. Operation

The laser scanner motor rotates in response to the instructions from the DC controller PCB, and its supply power is controlled by the scanner driver PCB.

The laser scanner motor(M3) rotates when the laser scanner motor drive signal (LMD=1) is sent by the DC controller PCB to the scanner driver PCB. At this time, the hall IC output signal returns from M3 for controlling the supply power used to rotate M3.

The power supply timing is controlled so as to respect the phase of the rotation reference pulses (FS) from the DC controller PCB, thereby ensuring a specific rotation speed.

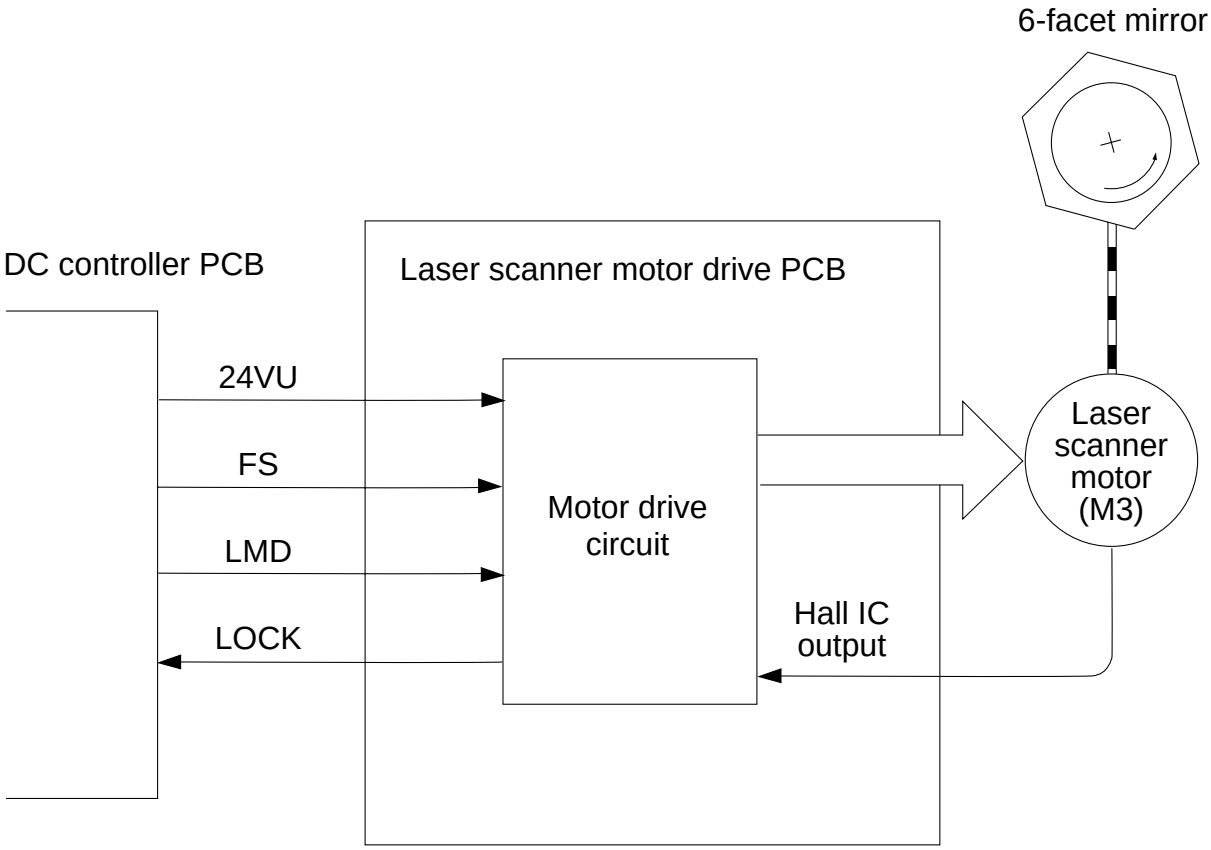

Figure 3-405

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2. Turning ON and OFF the Laser Scanner Motor

The laser scanner motor (M3) starts to rotate differently depending on whether 'time to quiet mode' in user mode is set to '1–9' or '0'.

If the time is set to '1–9', rotation starts when the following is performed during standby:

① Pressing a key.
② Opening the copyboard cover or the feeder.
③ Placing an original in the feeder.

If the time is set to '0', rotation starts when the Copy Start key is pressed.

The laser scanner motor turns OFF as set in 'time to quiet mode'. (If the time is set to '0', the rotation stops at the end of 'LSTR'.)

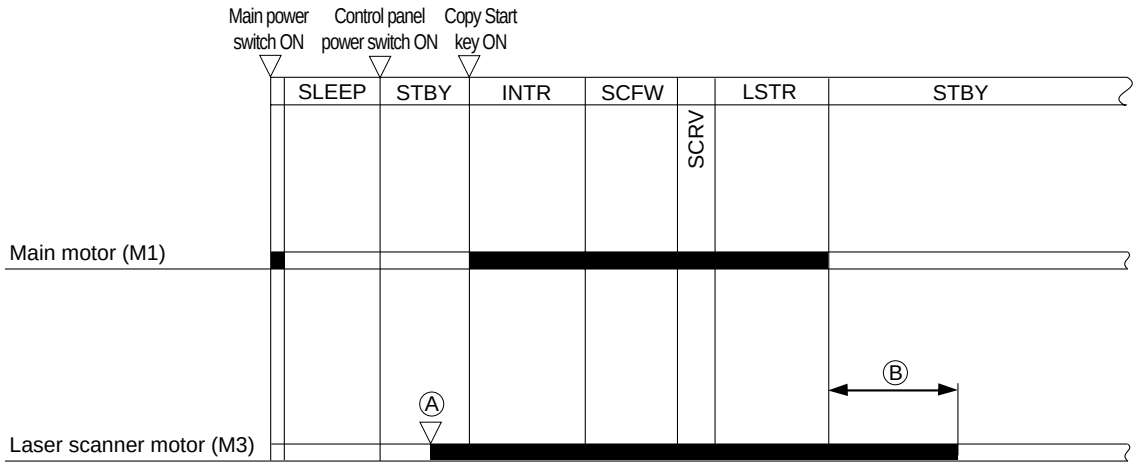

Figure 3-406

Ⓐ: With the setting of 'time to quiet mode' in user mode set to a value other than '0', a key on the control panel is pressed, an original is placed in the feeder, or the copyboard cover is opened.
Ⓑ: May be varied in user mode (quiet mode); if '0' is set, the period B will be removed.

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V. IMAGE FORMATION SYSTEM

A. High-Voltage Transformer Circuit

The high-voltage circuit associated with the formation of images is built as part of the composite power supply PCB and is used for the following:

- Controlling the primary charging
- Controlling transfer charging
- Controlling the current for the separation static eliminator to a specific level
- Controlling the developing bias DC component
- Turning ON and OFF the developing bias AD component
- Applying a transfer guide bias
- Turning ON and OFF the fixing bias

In addition to the high-voltage transformer circuit, the composite power supply PCB is equipped with lamp regulator and power supply circuit functions. The discussions here are limited to the high-voltage transformer circuit. (For general descriptions of the composite power supply PCB as a whole, see “Power Supply.”)

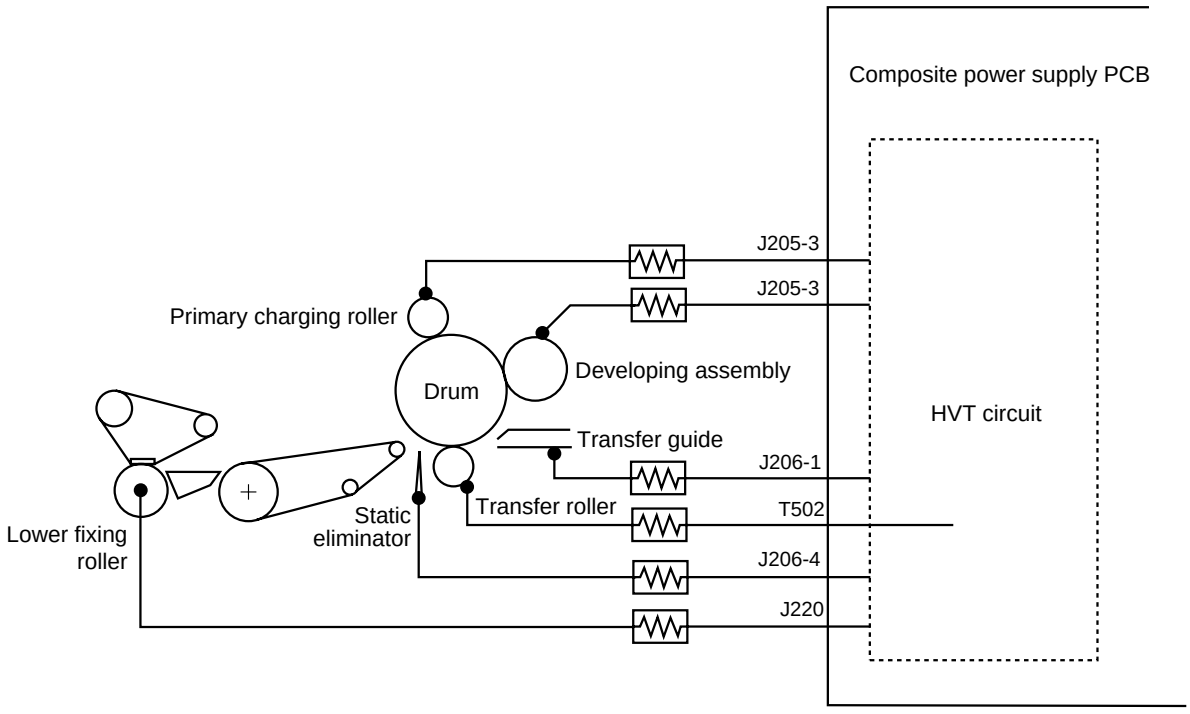

Figure 3-501

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■ Sequence of Operations
(high-voltage related outputs)

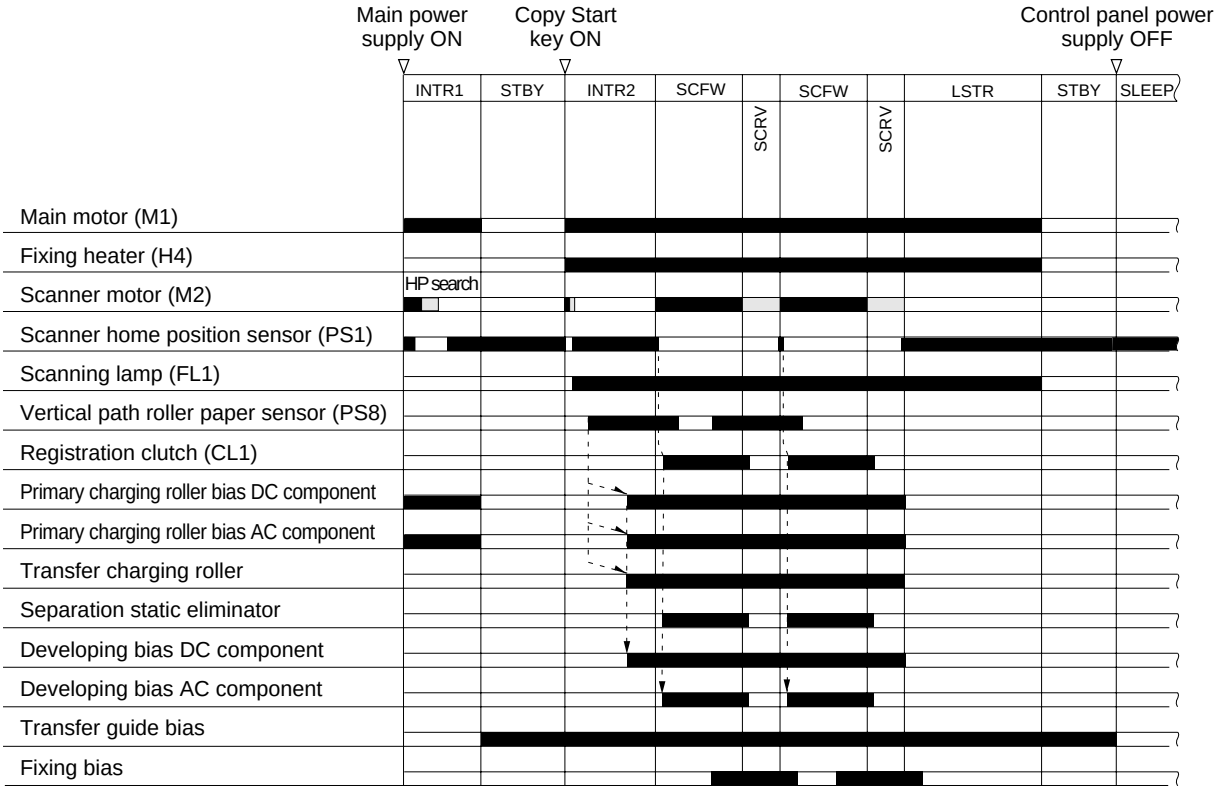

Figure 3-502

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B. Controlling the Primary Charging Roller Bias

1. Outline

The bias for the primary charging roller is controlled by the composite power supply PCB according to the instructions from the DC controller PCB.

In addition, an AC bias is applied to the primary charging roller to ensure stable charging.

The composite power supply PCB serves the following functions:

- Controlling the DC bias to a specific voltage
- Controlling the AC bias to a specific current

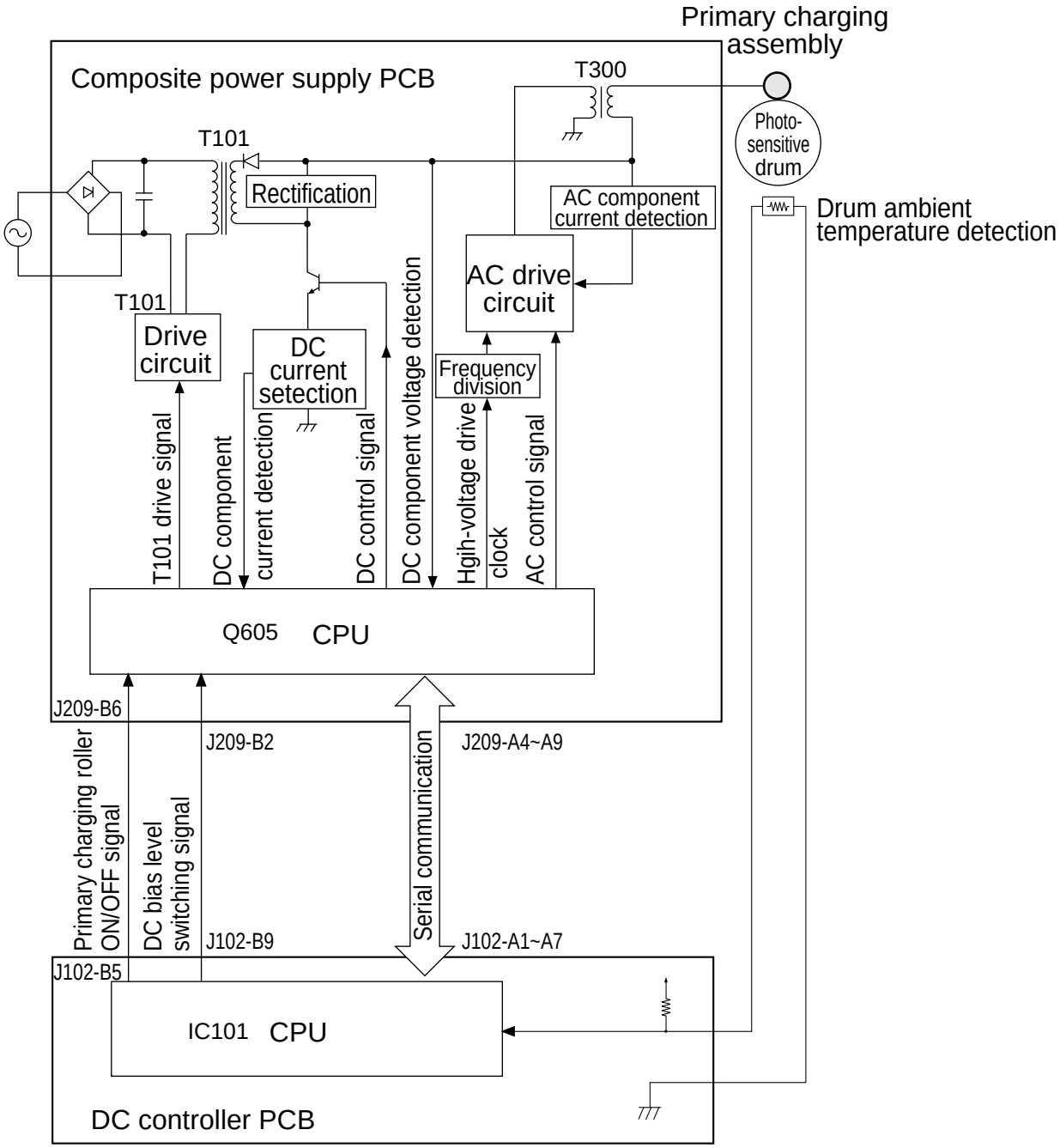

Figure 3-503

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2. Turning OFF and ON the Primary Charging Roller

The primary charging roller is turned ON and OFF by the primary charging roller ON/OFF signal (HVPDC) from the DC controller PCB.

The primary side of the main transformer (T101) on the composite power supply PCB operates under the control of the CPU (Q605). When the HVPDC signal is sent to the composite power supply PCB, the CPU (Q605) generates the DC control signal (PPWM) to turn ON the secondary side of T101, thereby applying a DC bias to the primary charging roller.

Then, the CPU generates the AC control signal (PAPWM) according to the data obtained from serial communications with the DC controller PCB. As a result, the transformer T300 is driven to apply an AC bias to the primary charging roller.

3. Controlling the Primary Charging Roller Bias

The output values of the DC bias and the AC bias applied to the primary charging roller are controlled by the DC control signal (PDPWM) and the AC control signal (PAPWM) generated by the CPU (Q605). (These two signals are pulse signals.)

In the case of the DC bias, the output voltage value is returned to the CPU (Q605) to vary the duty ratio of the DC control signal continuously and, thereby controlling it to a specific voltage (constant voltage control).

In the case of the AC bias, on the other hand, the current value of the AC bias output is detected and sent to the AC drive circuit.

The AC drive circuit uses the reference signal (AC control signal PAPWM) and the AC bias current value it has received to generate signals to drive the transformer T300, thereby controlling the AC bias to a constant current.

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4. Correcting the Drum Surface Potential

The drum surface potential fluctuating in relation to changes in the machine internal temperature is corrected by varying the primary charging roller bias voltage. The machine internal temperature is detected by the thermistor mounted to the rear plate of the machine, and the data is sent to the CPU on the DC controller PCB.

The CPU n the DC controller PCB subjects the data to computation, and the results are sent to the composite power supply PCB in serial communication mode.

The composite power supply PCB, in response, uses the data to determine the primary charging roller bias (DC) value.

5. Resistance of the Photosensitive Drum

The photosensitive drum can be thought of as a type of resistor. The resistance of the photosensitive drum tends to decrease because of changes over time.

To measure the resistance, the surface of the photosensitive drum is charged to an even potential at a specific voltage (DC + AC). The CPU on the composite power supply PCB samples the current of the charges being applied to find out the resistance of the photosensitive drum. The result is converted into a density correction curve to exert control for stable generation of good quality images, and this mode of control is called automatic density correction curve selection (AGC).

The timing at which measurements are taken is as follows:

- During initial rotation after a press on the Copy Start key
- During initial rotation after opening/closing the front door (except for jam removal purposes)
- During initial rotation after turning on the power switch on the control panel
- During post rotation after generating 500 copies/printouts

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C. Controlling the Transfer Charging Roller Bias

1. Outline

The GP215/GP200 uses direct transfer executed by means of a roller. As many as four types of biases are used for application to the transfer charging roller, and each has the following function and output timing:

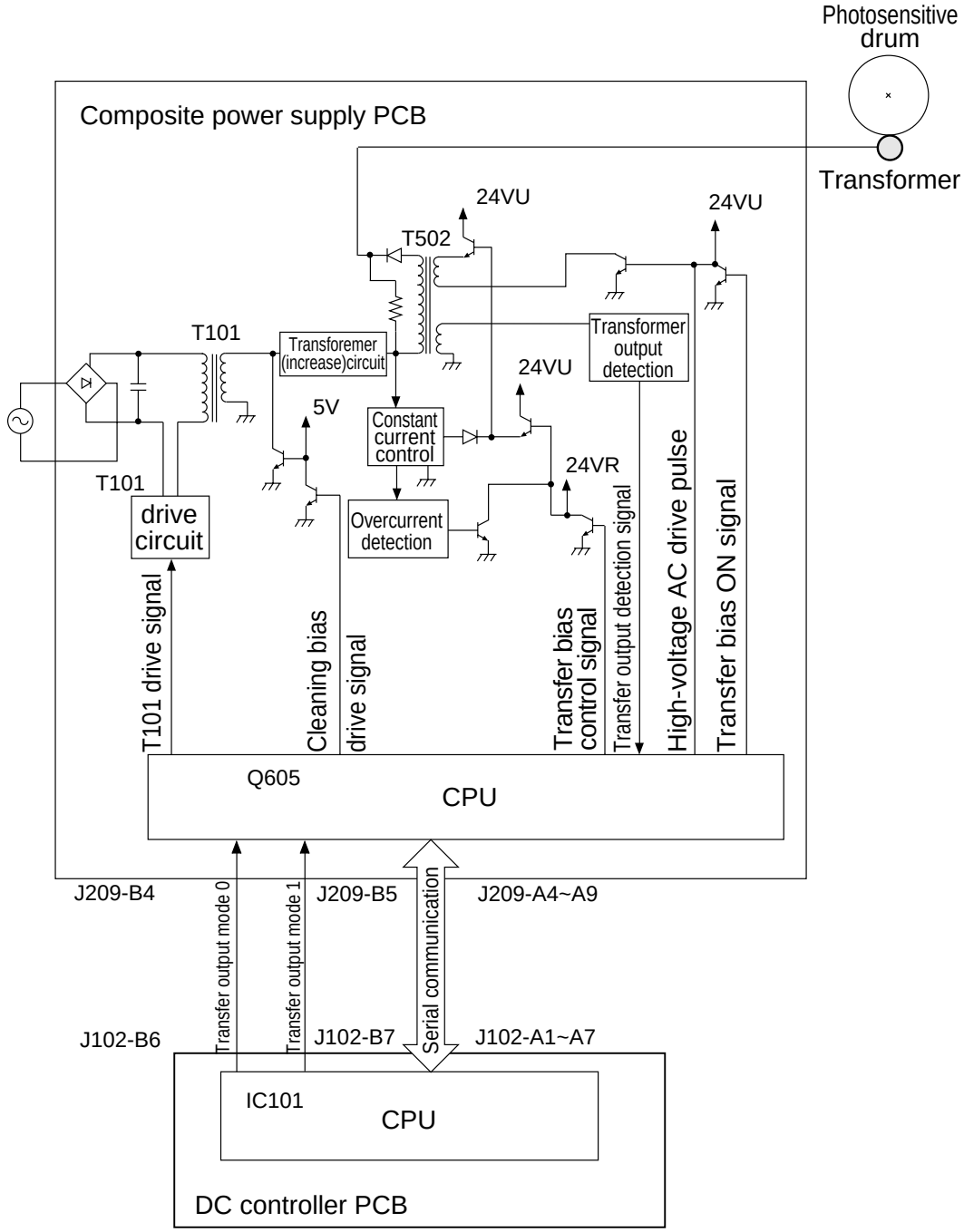

Figure 3-504

a. Transfer Bias

This bias is used for transfer of toner from the photosensitive drum to copy paper and is of a positive voltage. For output timing, see Figure 3-505.

b. Cleaning Bias

Since the machine uses direct transfer, toner from the photosensitive drum can stick to transfer charging roller because of a jam. A negative voltage is applied as follows, thereby returning the toner from the transfer charging roller to the photosensitive drum:

- During initial rotation after a press on the Copy Start key
- Part of the last rotation period
- During roller cleaning initiated in user mode ('adjustment/cleaning'; in this case, the primary charging roller is cleaned at the same time)

c. Reference Bias

At times, the transfer efficiency varies because of changes in the environment or in the resistance of the transfer charging roller. To prevent deterioration of images by such variations, the level of the application voltage to the transfer charging roller is corrected.

The reference bias is applied each time the Copy Start key is pressed, thereby correcting the voltage level.

d. Sheet-to-Sheet Distance

In continuous copying, the bias value is decreased so as to prevent adhesion of toner to the transfer charging roller between sheets of copy paper.

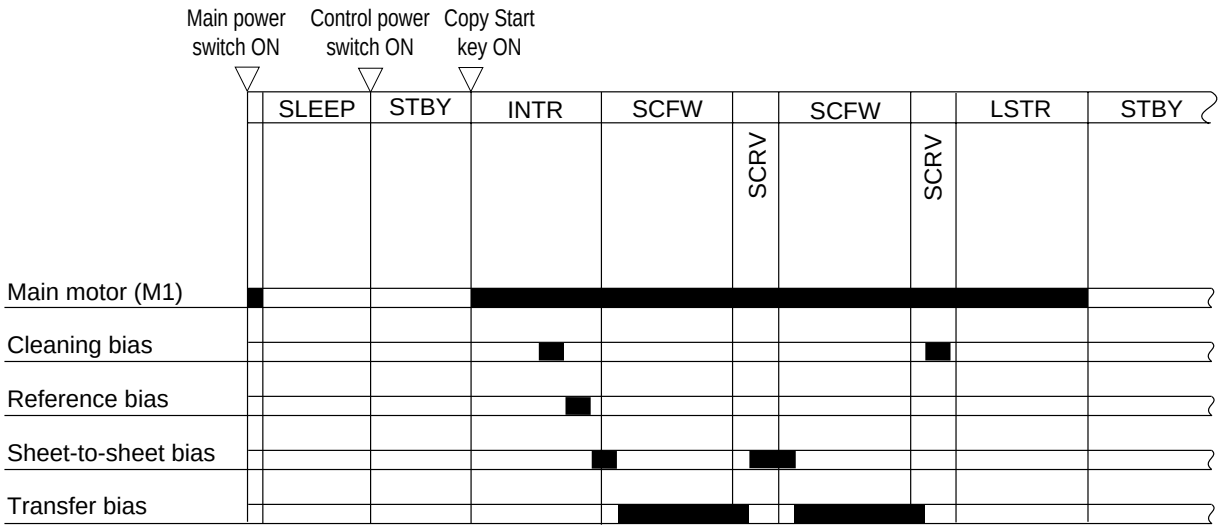

Figure 3-505

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2. Controlling the Transfer Charging Roller Bias

The transfer charging roller bias is controlled by the CPU (Q605) on the composite power supply PCB according to instructions from the DC controller PCB.

a. Switching between Bias Types

The aforementioned bias types are switched based on combinations of the transfer output mode 0 (HVTM0) and the transfer output mode 1 (HVTM1) from the DC controller PCB. (See Table 3-501.)

HVTM0	HVTM1	Bias type
0	0	Cleaning bias
1	0	Transfer bias
0	1	Reference bias
1	1	Sheet-to-sheet bias

Table 3-501

b. Turning ON and OFF the Cleaning Bias

When the cleaning bias drive signal (TREVON) of the composite power supply PCB goes '1', the secondary side of the main transformer (T101) turns ON to apply a cleaning bias (negative) to the transfer charging roller.

The timing at which the cleaning bias is applied is determined by serial communication data exchanged with the DC controller PCB.

c. Turning ON and OFF the Transfer Charging Roller

The transfer charging roller bias is turned ON and OFF by the transfer bias control signal (TFW-PWM) and the transfer bias ON signal (TFWON).

When the TFWON signal goes '0', the transformer T502 turns ON.

3. Adjusting the Transfer Charging Roller Bias

If image faults occur as a result of an incorrect transfer charging roller bias, the transfer bias may be adjusted under 'TRN-1', 'TRN-2TS', or 'TRN-20L' in service mode (*3*; ADJUST).

An image fault may be any of the following:

① Fogging is noted in the margin along the trailing edge because of stray toner.

② The density of copies increases every 94 intervals (approx.) when making half-tone copies (entire surface).

In the case of ①, increase the setting; in the case of ②, decrease the setting.

- Use TRN-1 to adjust the transfer bias for copying on the 1st side.
- Use TRN-2ST to adjust the transfer bias for copying on the 2nd side of a two-sided copy.
- Use TRN-20L to adjust the transfer bias for copying on the 2nd side of an overlay copy.

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D. Controlling the Developing Bias

1. Outline

Figure 3-506 shows the circuit used to control the developing bias of the composite power supply PCB, and the circuit has the following functions:

- Turning ON and OFF the AC component of the developing bias.
- Turning ON and OFF the DC component of the developing bias.
- Controlling the DC component of the developing bias to a specific voltage.

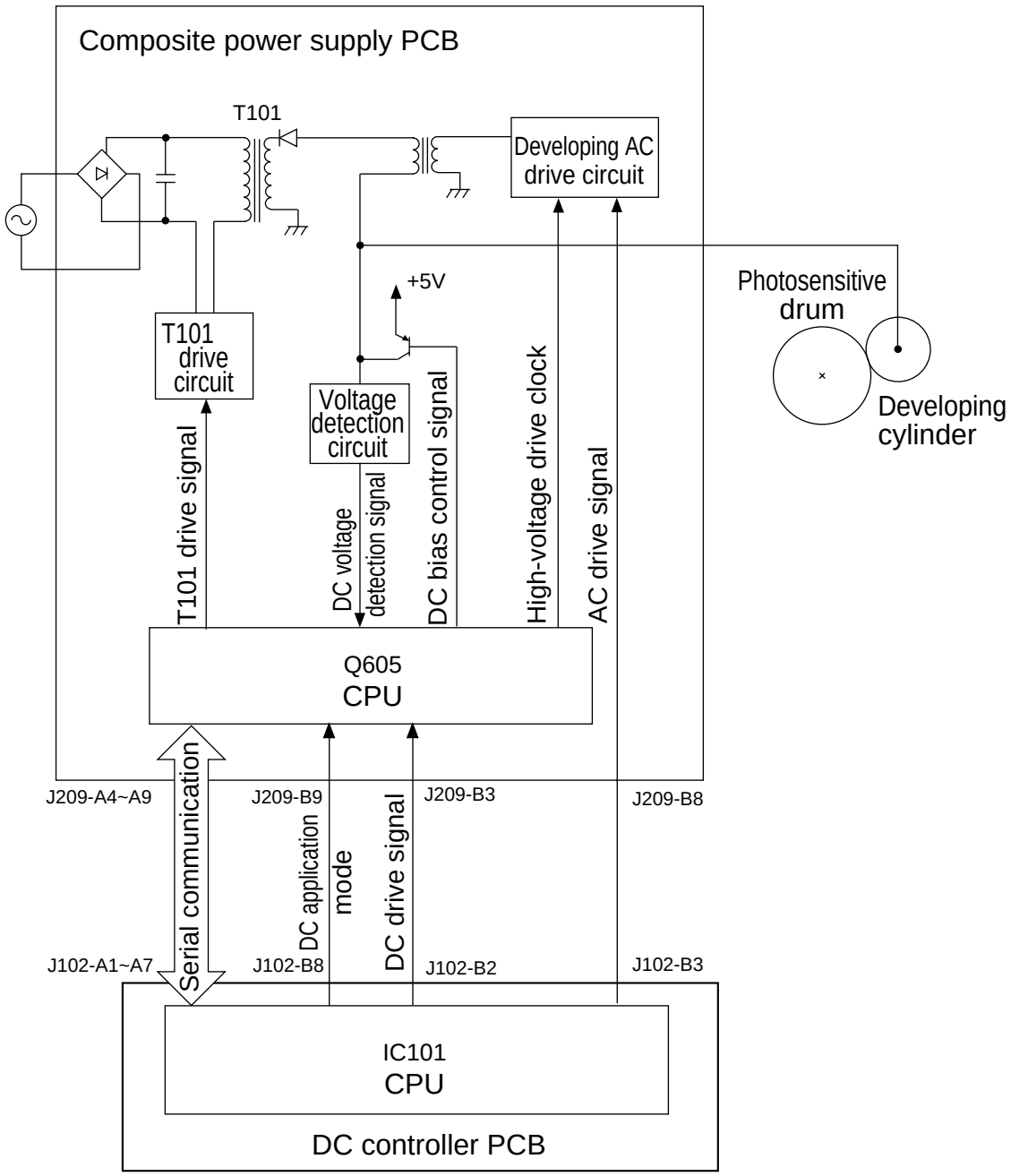

Figure 3-506

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2. Turning ON and OFF the DC Component of the Developing Bias

The DC component of the developing bias is turned ON and OFF by the DC bias ON/OFF signal (DCON) from the DC controller PCB.

The primary side of the main transformer (T101) on the composite power supply PCB operates under the control of the CPU (Q605). When the DCON signal is sent to the composite power supply PCB, the CPU (Q605) generates the DC bias control signal (BPWM), thereby turning ON the secondary side of the main transformer (T101) and applying the DC component of the developing bias.

3. Controlling the DC Component of the Developing Bias to a Specific Voltage

The CPU (Q605) on the composite power supply PCB receives the application voltage from the voltage detection circuit while the DC component of the developing bias is being applied. This way, the duty ratio of the BPWM signal is varied so as to ensure that the DC output voltage is maintained to a specific value.

4. Turning ON and OFF the AC Component of the Developing Bias

The developing AC drive circuit on the composite power supply PCB receives drive pulse signals from the CPU (Q605). When the AC drive signal (ACON) is sent directly from the DC controller PCB to the AC drive circuit, the AC component generation transformer (T400) turns ON to add an AC component to the DC component of the developing bias.

Application frequency: 1838 Hz
Application voltage: 800 Vp-p

5. Varying the DC Component of the Developing Bias

The density of the image during copying is adjusted by varying the density correction curve (DC component of the developing bias).

However, during printing under a printer function, the density is adjusted by fixing the density correction curve and varying the bias DC component to maintain good gradation.

To correct image faults occurring because of changes in the drum, control is exerted at a specific timing (according to AGS measurement to increase the developing bias).

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E. Controlling the Separation Static Eliminator Bias

1. Turning ON and OFF the Separation Static Eliminator Bias

The separation static eliminator ON signal (SEBON) causes the CPU (Q605) on the composite power supply PCB to drive the separation static eliminator bias drive circuit to apply a bias on the separation static eliminator.

2. Controlling the Voltage to a Specific Level

The separation static eliminator bias output is returned to the bias drive circuit to control the voltage to a specific value.

3. Switching the Separation Static Eliminator Bias Voltage

The separation bias differs physically for copying on the first and second side of a two-sided or an overlay copy.

To suit differences, the separation static eliminator drive signal 1/2 is used to switch the bias voltage, ensuring stable separation.

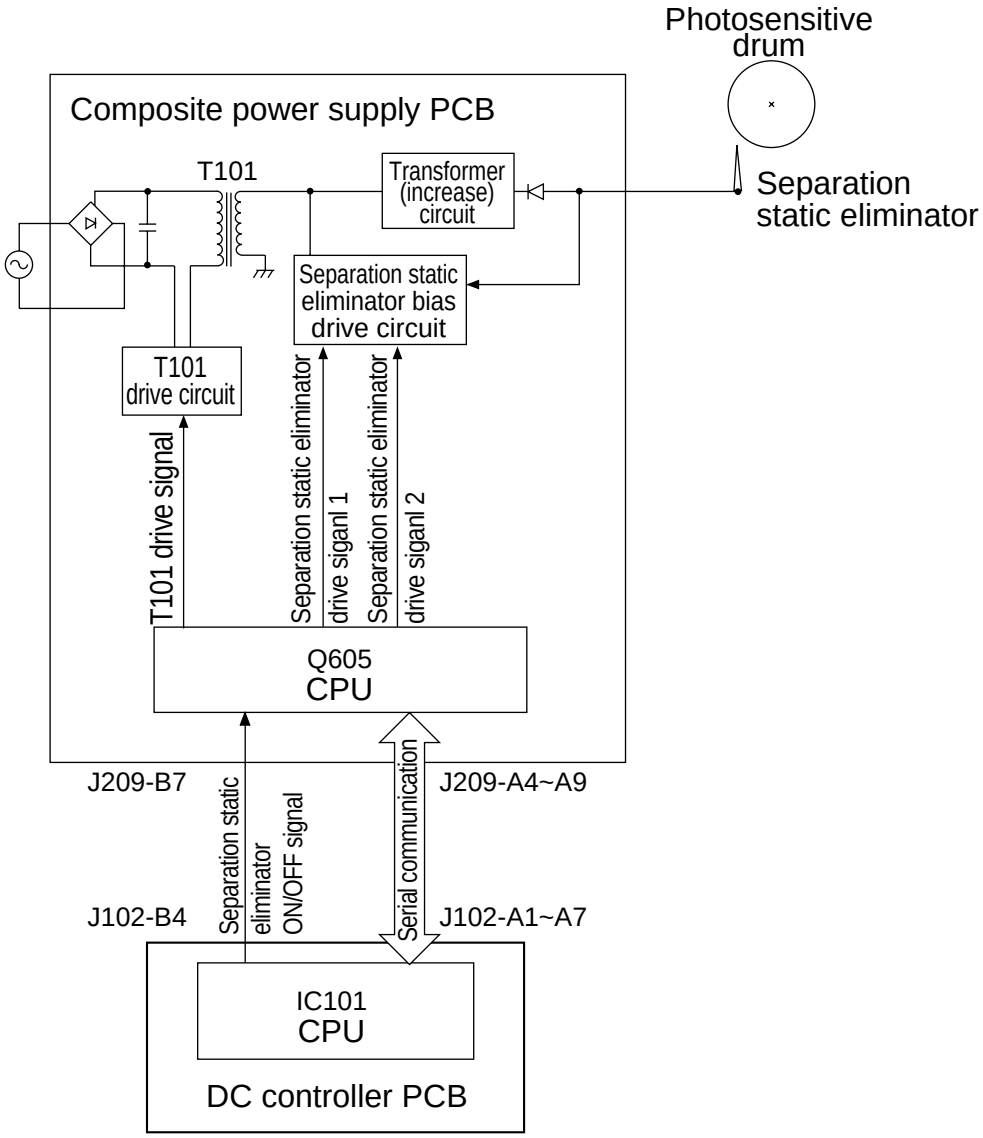

Figure 3-507

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F. Controlling the Transfer Guide/Fixing Roller Bias

1. Transfer Guide Bias

The transfer guide bias is used to prevent adhesion of toner to the transfer guide and has a negative potential (–600 VDC) as in the case of toner.

The application continues as long as the control panel power remains ON.

2. Lower Fixing Roller Bias

A positive component is applied to the steel core of the lower fixing roller to prevent offset to the fixing film.

The terminal on the lower fixing roller shaft is for this purpose; pay attention to the orientation of the lower roller if you have removed it.

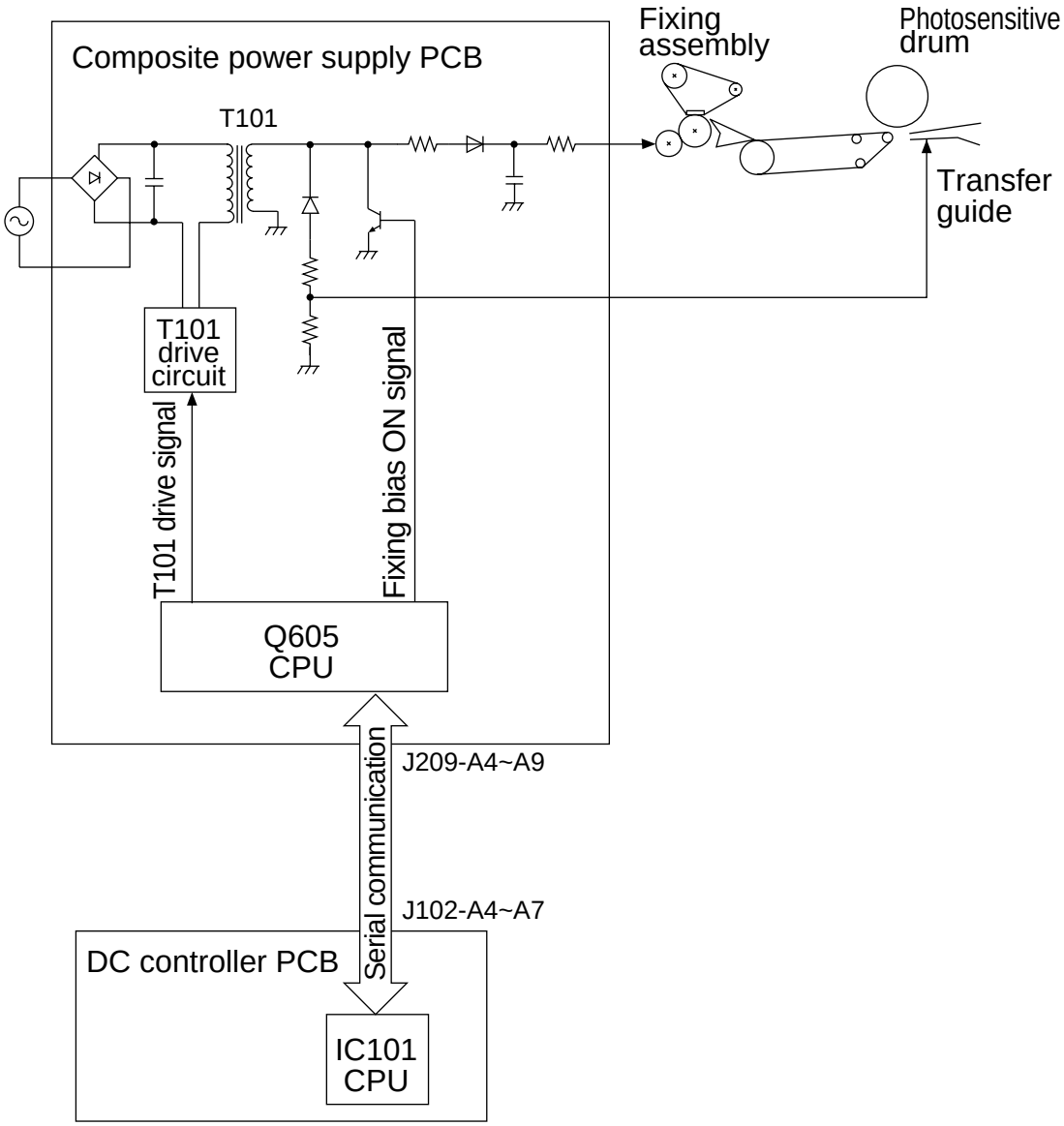

Figure 3-508

G. Developing Assembly/Drum Cleaner

1. Outline

The developing assembly is locked manually by operating the locking lever for each developing rail.

The developing cylinder, stirring rod in the developing assembly, and the feeding blade inside the drum cleaner are rotated by the drive of the main motor.

The level of toner is detected in reference to the toner absent signal (TEP) from the toner level sensor (TS1) inside the developing assembly.

The waste toner collected by the cleaning bale is collected inside the cleaner case, and the waste toner sensor (PS10) turns on when the waste toner case becomes full.

2. Detecting the Level of Toner

A toner sensor (TS1) of an oscillator type is provided inside the developing assembly to monitor the level of toner.

When the toner inside the developing assembly is more than a specific level, the output of the toner sensor goes '1'. When the toner falls below a specific level, on the other hand, the output of the toner sensor goes '0'.

The CPU on the DC controller PCB reads the output of the toner sensor while the developing clutch (CL4) remains ON. It then computes the period during which the toner sensor output remained ON to issue a message to initiate toner supply. See Table 3-502 and Figure 3-510 for how this is done.

Result	Operation	Resetting
Toner absent level 1 is assumed if the sum of the periods in which toner is absent is 20 sec or more in the past two checks.	Toner supply is initiated, but copying operation is prohibited. (FAX reception and printer output are possible.)	Resetting occurs when toner has been stirred by keeping the developing clutch ON for 6 sec after the control panel power switch was tuned ON or the front door was opened and closed.
Toner absent level 2 is assumed if the sum of the periods in which toner is absent is 160 sec or more.	Toner supply is initiated, but copying operation, FAX output, and printer operation are all prohibited.	Resetting occurs when toner has been stirred after keeping the developing clutch ON for 30 sec and detecting the presence of toner after the control panel power switch was turned ON or the front door was opened and closed.

Table 3-502

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■ Computation of Toner Level Detection

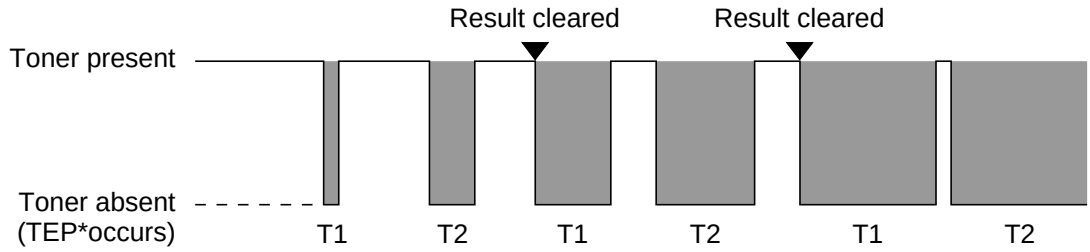

Figure 3-510a

Since toner is stirred by the stirring rod inside the developing assembly, the toner absent and present states repeat at intervals as shown in Figure 3-510a.

- The absence of toner is assumed by monitoring TEP* only while the developing clutch remains ON; i.e., such periods as when the developing clutch remains ON are added.
- The sum of periods from when the toner absent signal (TEP*) occurs until the end of the toner absent signal occurring as a result of stirring the toner is referred to as T1.
- The sum of period from the start of the next toner absent signal until the end of the toner absent signal is referred to as T2.
- Thereafter, the sums are cleared and replace by alternately adding subsequent T1 and T2.

Based on the results of the foregoing additions, the absence of toner is assumed for the following:

- (T1 + T2) > 20 sec .....toner absent level 1
- (T1) or (T2) > 160 sec.....toner absent level 2

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3. Detecting Waste Toner

The waste toner that has been scraped by the cleaning blade is forwarded to the rear of the cleaner housing by the waste toner feeding blade inside the drum cleaner.

The coupling shown in Figure 3-511 is pushed against the blade under the pressure of a spring to transmit the drive of the main motor to rotate the blade.

When the cleaner housing becomes full of toner, the rotation of the waste toner feeding blade drags and the coupling moves back and forth in the axial direction to press the waste toner sensor lever, thereby causing the waste toner sensor (PS10) to turn ON and OFF alternately.

The DC controller PCB monitors the output of the waste toner sensor for about 8 sec after the main motor turns ON. The waste toner case is assumed to be full of waste toner when the output of the waste toner sensor is detected ten times or more during the period.

Upon detection, the Waste Toner Case Full message will be indicated during standby.

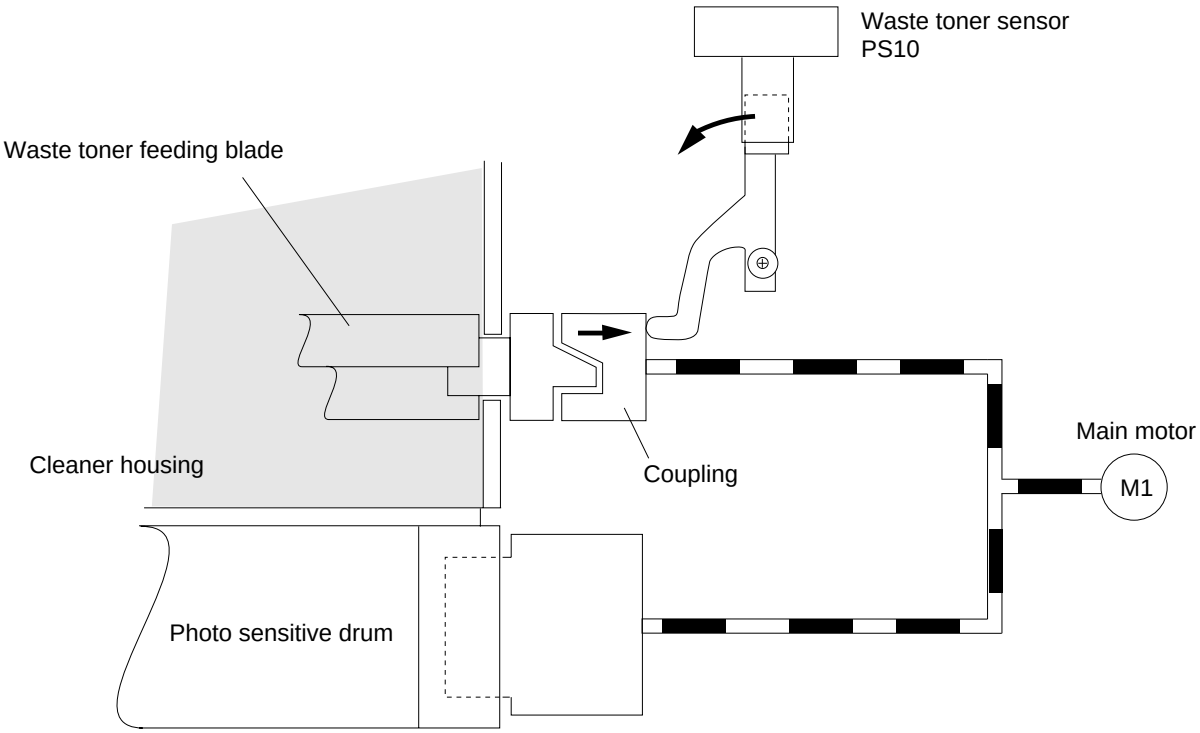

Figure 3-511 (conceptual diagram)

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CANON GP215/200 REV.0 JULY 1996 PRINTED IN JAPAN (IMPRIME AU JAPON)

H. Primary Charging Roller Cleaning Mechanism

1. Outline

The GP215/GP200 is equipped with a mechanism which automatically cleans the primary charging roller.

The primary charging roller cleaning solenoid (SL1) is turned ON while the primary charging roller is rotating to butt the cleaning pad against the primary charging roller while, at the same time, the primary charging roller is moved back and forth in the axial direction of the primary charging roller.

This cleaning is executed under the following conditions:

- During last rotation after the end of copying operation when making 50 or more copies continuously.
- During last rotation when the cumulative number of copies reaches 500 or more when making 50 copies or less.
- When 'adjustment/cleaning' is executed in user mode to clean the roller (in this case, a cleaning bias is applied to the transfer charging roller and the roller is cleaned at the same time).

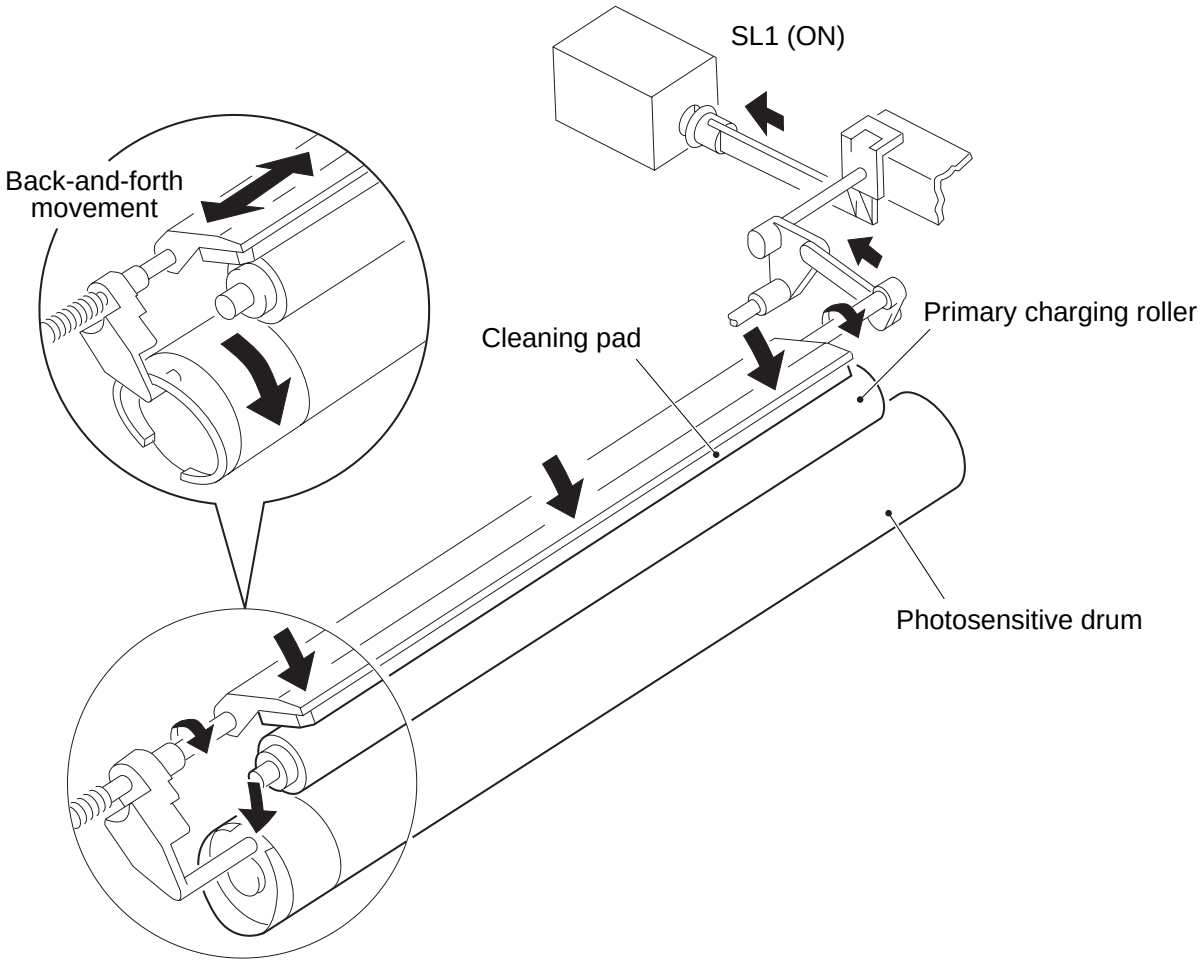

Figure 3-512

I. Detecting Errors on the Composite Power Supply PCB

The composite power supply PCB is equipped with a self diagnostic function which checks for an error in the output of the PCB and its communication with the DC controller PCB.

The results of detection are indicated by changing the intervals at which LED100 on the DC controller PCB flash. (See p. 3-75.)

At the same time, the results are sent to the image processor PCB to indicate an error code on the control panel.

When an E coded is indicated, the machine may be reset by turning ON and OFF the main power supply. As described later, errors which cause the scanning lamp are also checked by this detection mechanism. (Resetting the machine after such errors requires replacement of the scanning lamp.)

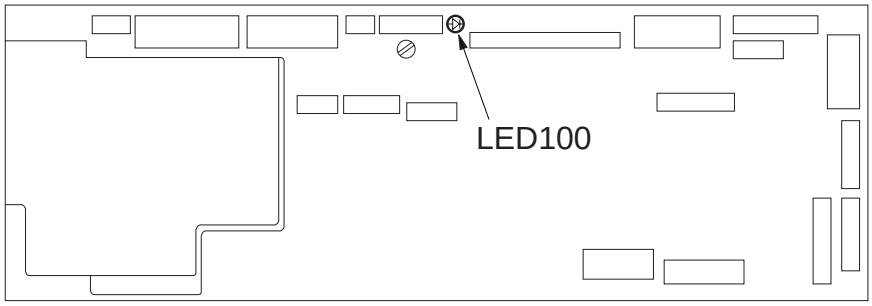

Figure 3-513 DC Controller PCB

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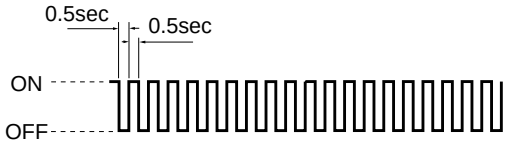
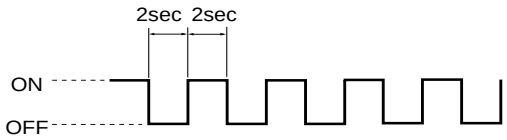
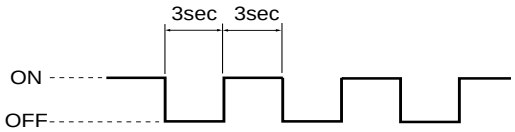
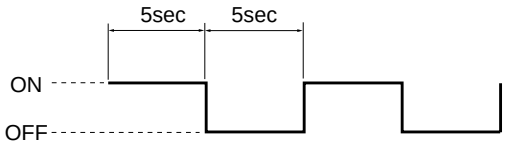
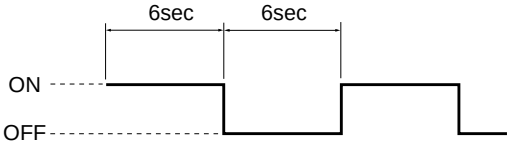
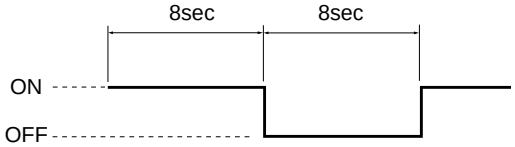
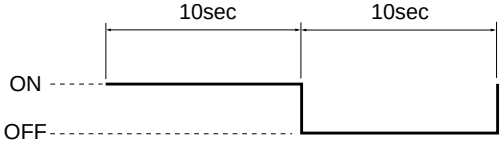
■ Status Indications by Flashing LED

Flashing intervals	Classification	Description
Intervals of 0.5 sec 	Normal	The composite power supply PCB is operating normally.
Intervals of 2 sec 	Overcurrent	The composite power supply PCB has detected an overcurrent because of trapped wiring or an error in a load in relation to +24VR or +24VU output.
Intervals of 3 sec 	Low-voltage control error in standby	The difference between the setting for +24VR output and the control value in standby is larger than specified. Upon detection, error data is sent to the DC controller PCB. 'E803' will be indicated on the control panel.
Intervals of 5 sec 	Error in the communication with the DC controller PCB	An error has occurred in the communication between the DC controller PCB and the composite power supply PCB, and the communication data is not renewed for 8 sec or more. However, LED100 on the DC controller may not flash or turn ON at times. 'E191' will be indicated on the control panel.
Intervals of 6 sec 	Low-voltage control error during copying*	The difference between the setting of the +24VR output and the actual control value is more than specified. Upon detection, error data will be sent to the DC controller PCB. 'E803' will be indicated on the control panel.
Intervals of 8 sec 	+5.1V output control error	+5.1V output is outside the specified range. All outputs of the composite power supply PCB will be stopped so that the display indications on the control panel will also turn OFF.
Intervals of 10 sec 	Check sum error on the DC controller PCB	The CPU on the DC controller PCB has detected a check sum error in the communication data twice in a row. All outputs of the composite power supply PCB will be stopped. 'E1921' will be indicated on the control panel.

* The same error can occur when the fluorescent lamp has deteriorated over time or fails to turn ON. As such, if the LED flashes at intervals of 6 sec, check to make sure that the inner side of the glass around the filament at both ends of the fluorescent lamp has not become black.

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VI. PICK-UP/FEEDING SYSTEM

A. Outline

The GP215/GP200 uses center reference, in which copy paper moves along the center of the pick-up/feeding assembly. The pick-up system consists of two cassettes (upper, lower) and the multifeeder.

Copy paper from any of the cassettes or the multifeeder is controlled by the registration roller so that its leading edge matches the leading edge of the image on the photosensitive drum; the paper is then sent to the copy tray.

As many as nine sensors are used to monitor the movement of copy paper. (Seven sensors are used to detect jams.)

Figure 3-601 shows the arrangement of sensors (electrical input parts), and Figure 3-602 shows the arrangement of motors as well as clutches and solenoids (electrical output parts). (The figures do not cover the cassette drive system.)

Notation	Name	Signal	Jack*
PS4	Multifeeder paper sensor	MFPD*	J113-A11
PS5	Pre-registration paper sensor	PDP1	J113-A5
PS7	Fixing rear paper sensor	PDP3	J109-6
Q1604	Upper cassette paper sensor	UCSPD*	J114-A10
Q1605	Lower cassette paper sensor	LCSPD*	J114-A11
PS8	Vertical path paper sensor	PDP4	J113-A2
PS11	Re-pick up front paper sensor	PDP5*	J103-2
PS12	Lower feeding assembly inlet paper sensor	PDP6*	J105-B2
PS13	Delivery sensor	PDP7*	J105-A2

*Jack in the signal line on the DC controller PCB.

Table 3-601 List of Pick-Up/Feeding System Sensors

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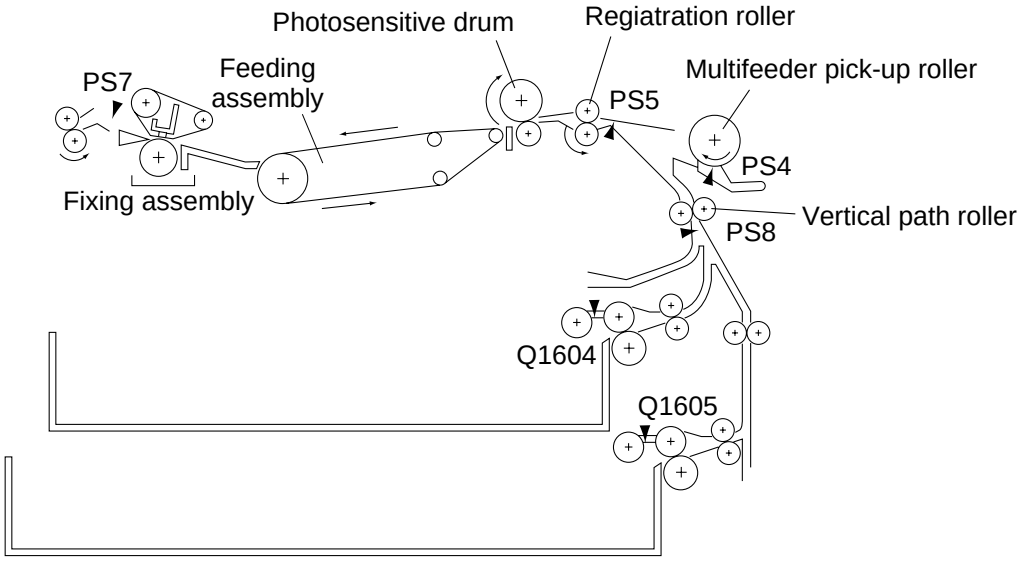

Figure 3-601 Pick-Up/Feeding Assembly Sensors

No.	Name
CL1	Registration roller clutch
CL2	Multifeeder roller clutch
CL3	Vertical path roller clutch
CL5	Lower feeding assembly re-pick up clutch
SL4	Re-pick up flapper solenoid
SL5	Paper deflecting plate 1 solenoid
M1	Main motor
M6	Set-back roller drive motor
M7	Lower feeding assembly inlet roller drive motor
M8	Delivery roller drive motor

Table 3-602 Pick-up/Feeding System Motors, Clutches, and Solenoids

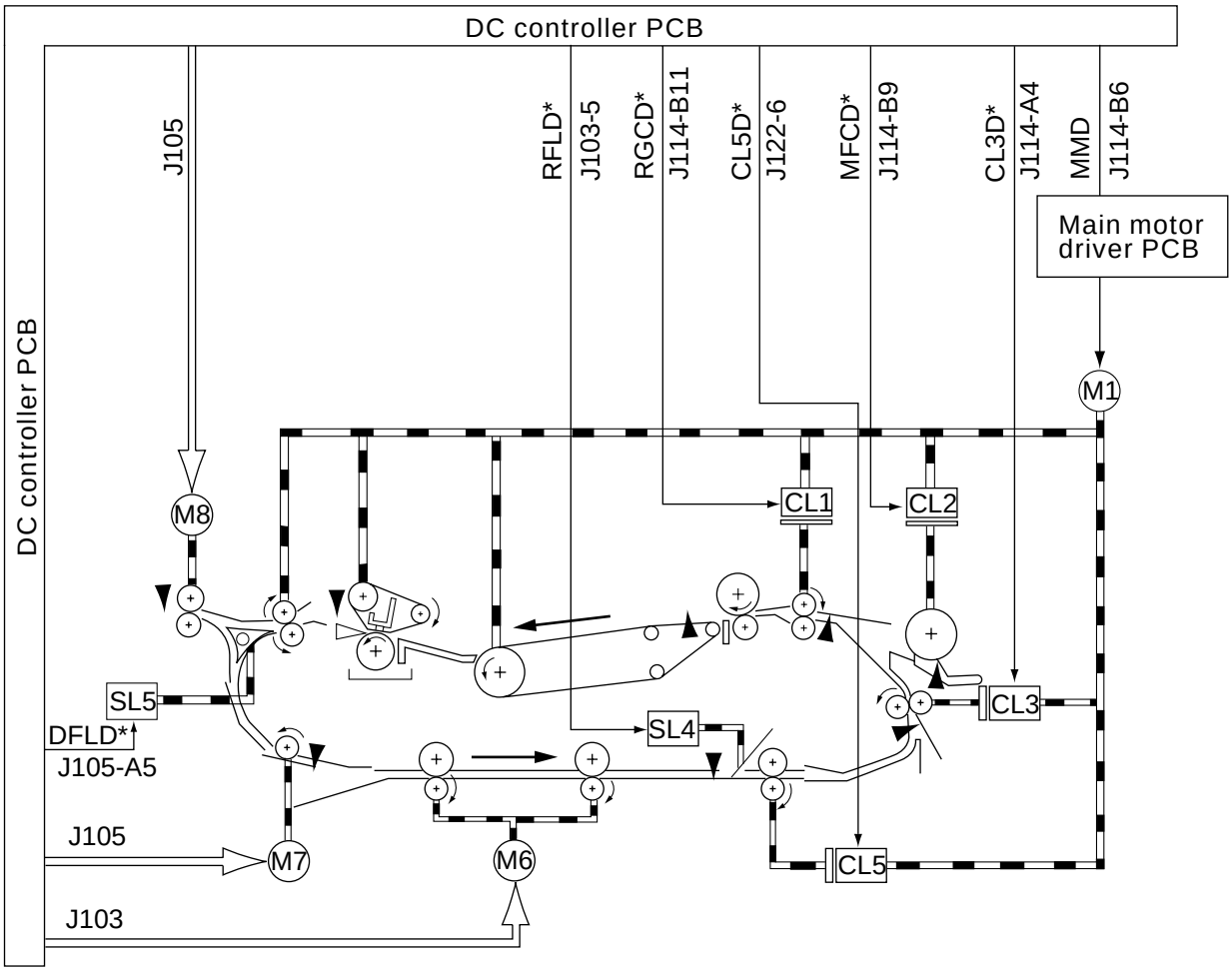

Figure 3-602 Pick-Up/Feeding System Motors, Clutches, and Solenoids

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B. Pick-Up from the Cassette

1. Pick-Up Operation

The copy paper inside the cassette is held up by the lifter so that it is in contact with the pick-up roller during pick-up.

The pick-up roller is driven by the cassette pick-up motor (M4) and is lowered to reach copy paper at time of pick-up.

The pick-up roller is lowered by the movement of a cam operated by the drive of the main motor (M1) switched by the pick-up roller down solenoid (SL2).

The feeding roller and the separation roller make sure that only one sheet of copy paper is fed; the copy paper is moved to the feeding assembly and then to the registration roller by the vertical path roller 1/2.

The drive of the vertical path roller and the pre-registration roller is from the main motor (M1) switched by turning ON and OFF the vertical path roller clutch (CL3).

The drive of the registration roller is from the main motor (M1) coming by way of the registration roller clutch (CL1).

Figure 3-603 shows the arrangement of the electrical parts and the concept of the drive mechanism, and Table 3-603 shows the sensors and sensor signals.

Notation	Name	Signal	DC controller
M1	Main motor	MMD	J114-B6
M4	Cassette pick-up motor	Note	J114
CL1	Registration roller clutch	RGCD*	J114-B11
CL3	Vertical path roller clutch	CL3D*	J114-A4
SL2	Pick-up roller down solenoid	SL2D*	J114-A5

Note: Pulse signal so that it cannot be checked by a meter in reference to its state (0, 1).

Table 3-603 List of Loads in the Cassette Pick-Up Assembly

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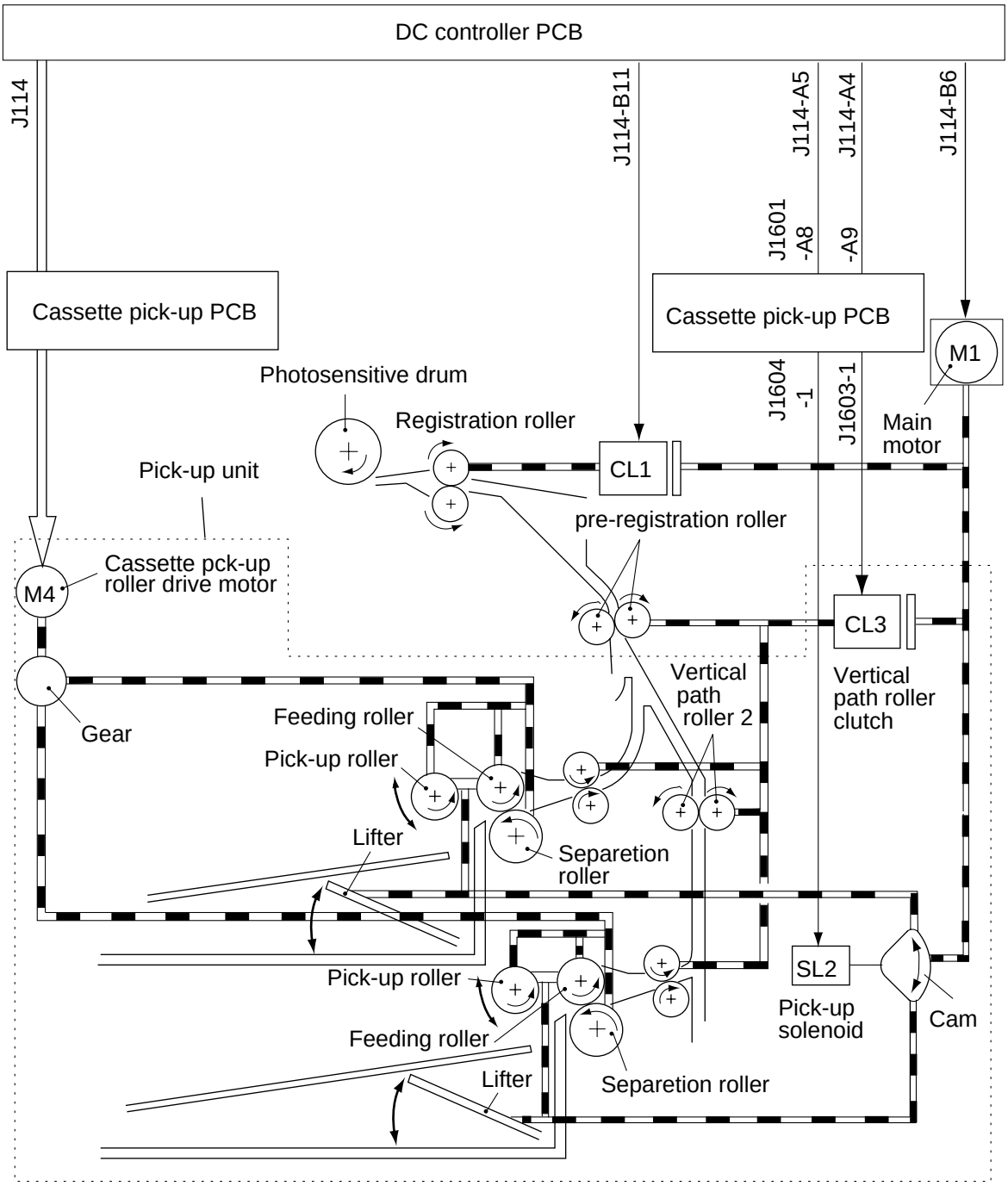

Figure 3-603 Conceptual Diagram of the Pick-Up Unit Drive Mechanism

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Notation	Name	Signal	Jack*
Q1604	Upper cassette paper sensor	LCSPD	J105-10
Q1605	Lower cassette paper sensor	LCSPD	J105-11
Q1606	Upper cassette paper level sensor 0	1RPD0	J108-1
Q1607	Upper cassette paper level sensor 1	1RPD1	J108-2
Q1608	Lower cassette paper level sensor 0	2RPD0	J108-3
Q1609	Lower cassette paper level sensor 1	2RPD1	J108-4

*Jack in the signal line on the DC controller PCB.

Table 3-604 Sensors on the Cassette Pick-Up PCB (pick-up unit)

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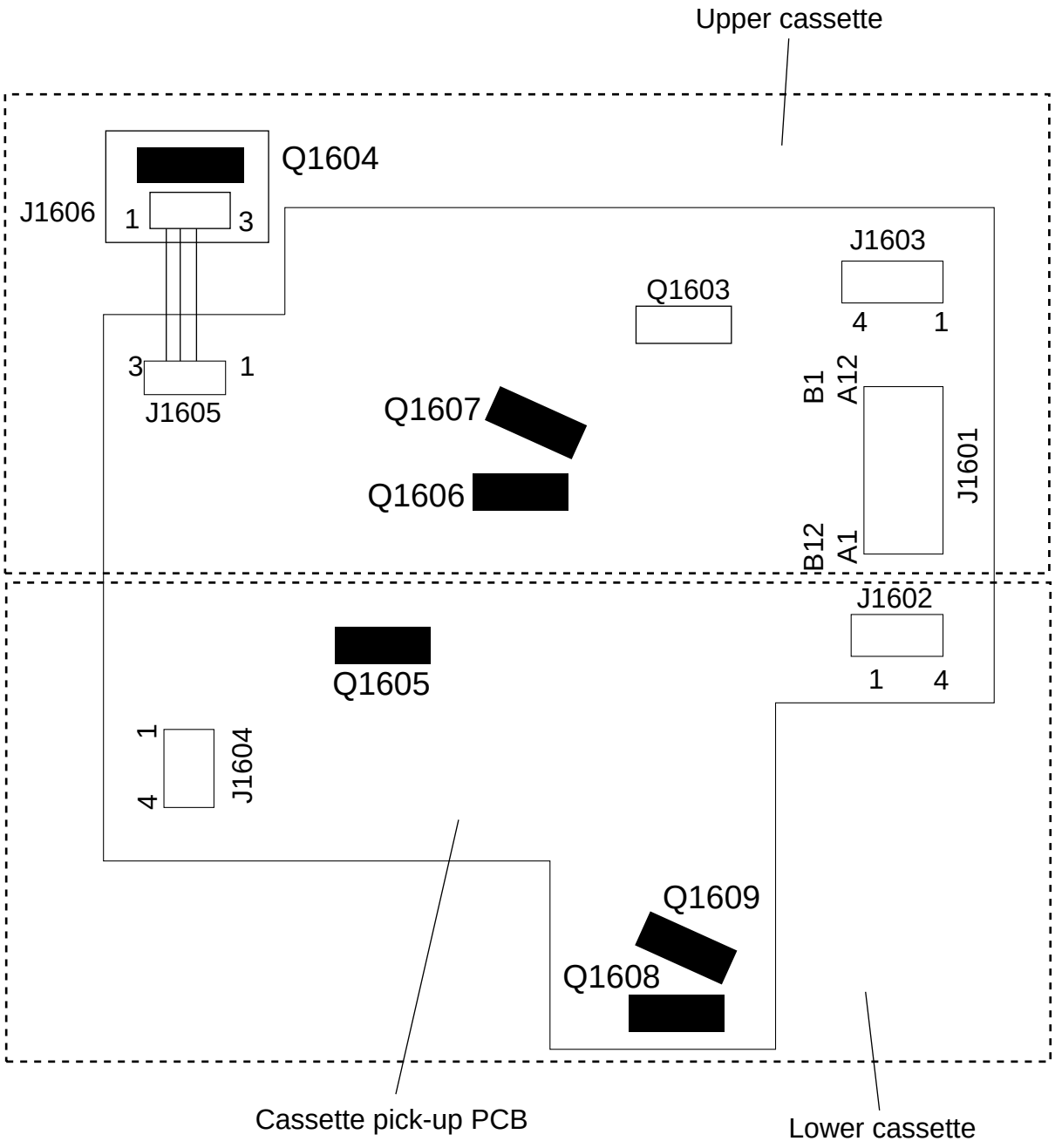

Figure 3-604 Sensors on the Cassette Pick-Up PCB

Note:
The sensor Q1603 is not used in the copier's pick-up unit.

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2. Basic Sequence of Operations

• Cassette 1, A4, 2 Copies, Continuous

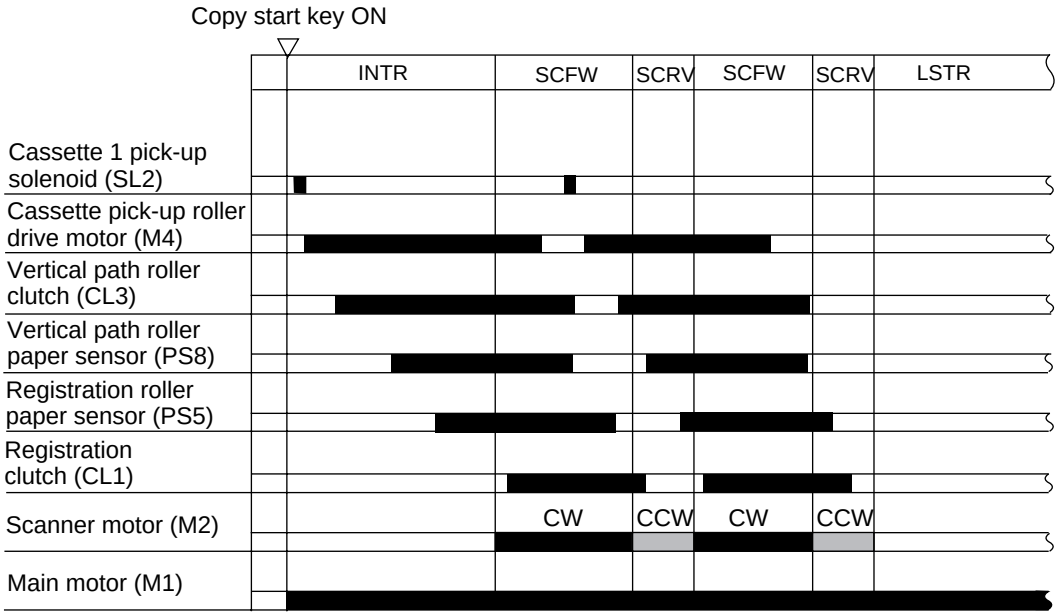

Figure 3-604 Sequence of Pick-UP Operations (cassette)

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3. Cassette Lifter Operation

As long as the cassette is set, the cassette lifter is operated as necessary during copying operation so as to maintain the level of the paper stack at a specific position.

a. Lifter Movement during Copying

The stack surface is maintained at a specific height by operating the lifter during copying as follows:

The lifter movement starts when the pick-up roller shaft pushes the lifter trigger lever to release the cam.

The lifter movement ends when the cassette runs out of copy paper.

1) As copy paper runs out, the movement of the pick-up roller increases.

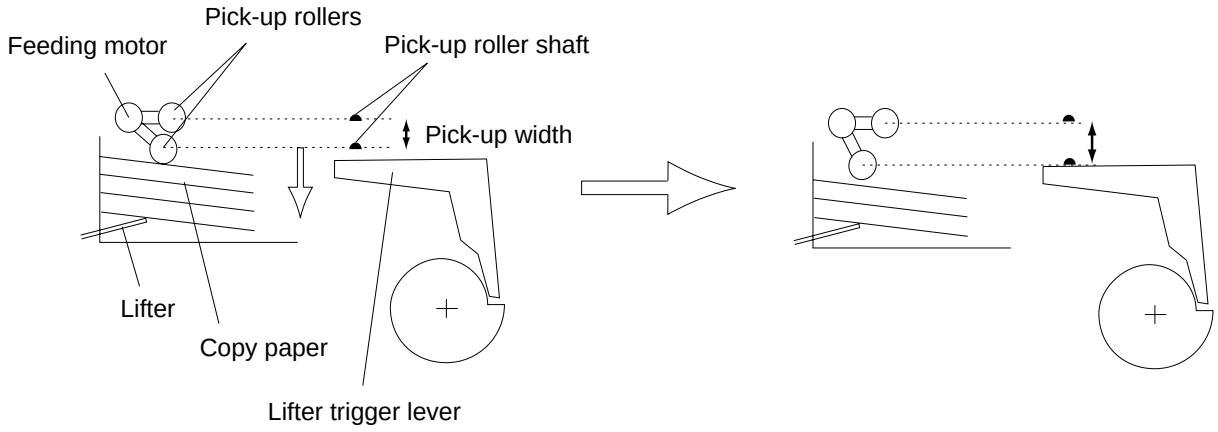

Figure 3-605

2) The stack surface lowers further and the pick-up roller shaft lowers accordingly, causing the pick-up roller shaft to push the lifter trigger lever. This movement frees the cam so that the cam starts to rotate.

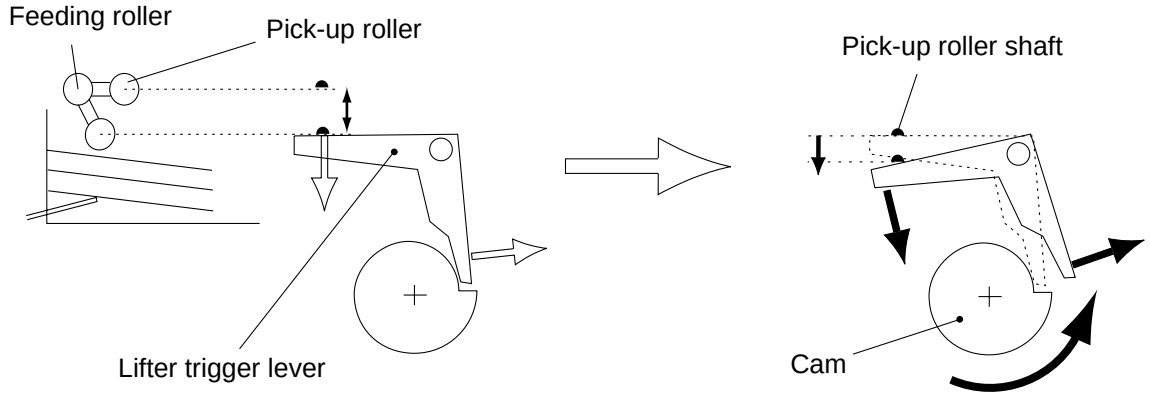

Figure 3-606

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3) The rotation of the cam moves the lever, thereby lifting the lever.

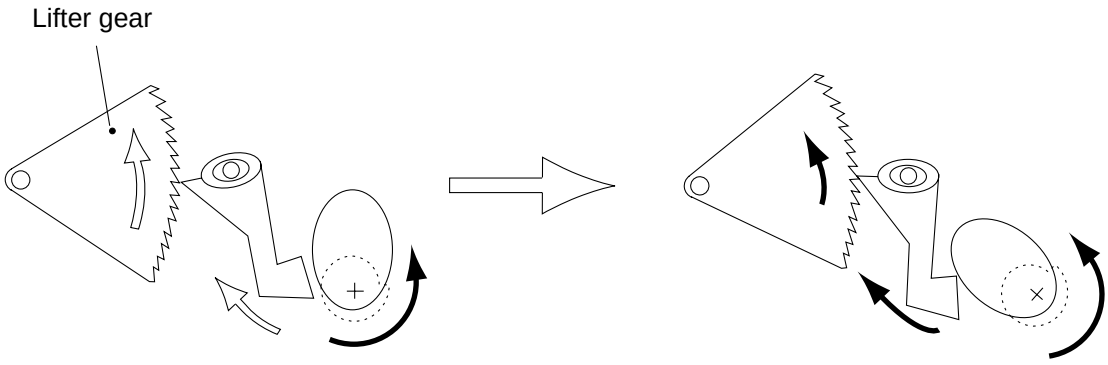

Figure 3-607

4) The stack surface rises in response to the rising lifter; since the height of the pick-up roller shaft will also increase, the spring pulls the lever to restrain the cam.

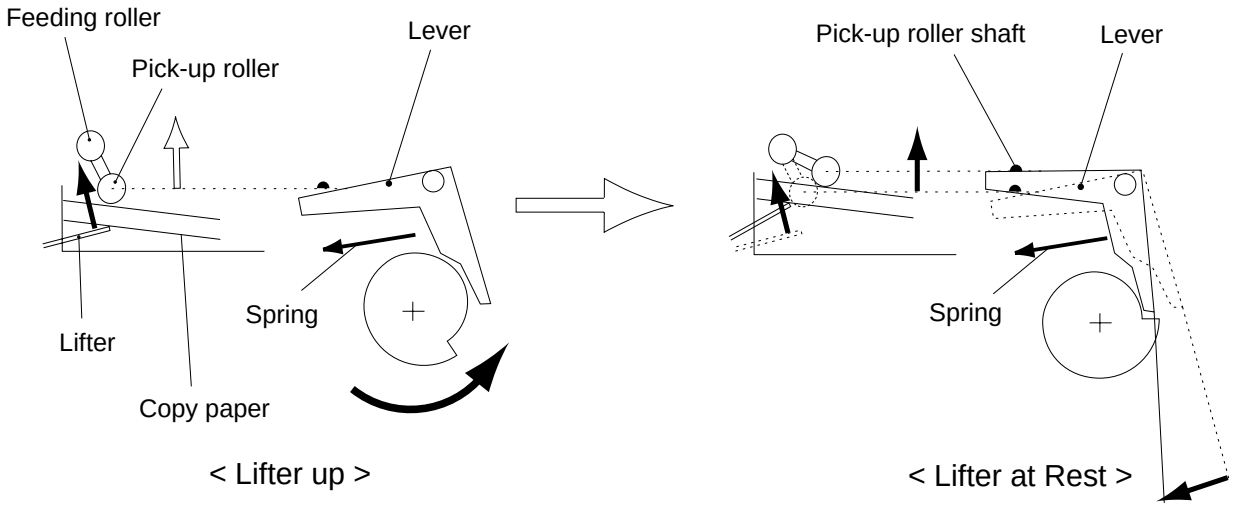

Figure 3-608

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b. Releasing the Lifter

The lifter drive is released mechanically in that it is released when the cassette is slid out. As many as two types of claws are at work (one moving up the lifter and one holding the lifter). When the machine is in standby state, the lifter gear is supported by the retaining claw; when the cassette is slid out, the retaining claw is released to let the lifter down.

Caution:

If the main power supply is cut off while the lifter is moving up, the claw used to move up the lifter can hold up the lifter while remaining in contact with the lifter gear depending on when the power is removed. Such a condition may not fully release the lifter so it is important to turn OFF and ON the main power to start standby state. Forcing the casstte out in such a condition can result in damage.

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4. Cassette Pick-Up Operation

a. Pick-Up Operation

① The pick-up roller is rotated by the cassette pick-up motor (M4).

② The cassette pick-up motor is rotated clockwise or counterclockwise under the control of the cassette pick-up PCB. When copy paper is supplied from the upper cassette of the pick-up unit, the cassette motor is rotated clockwise; when paper is from the lower cassette, on the other hand, the cassette pick-up motor rotates counterclockwise.

③ Pick-Up Roller Shaft Reference
When the cassette is installed to the machine, the pick-up roller is lowered or the lifter is raised in reference to the position of the pick-up roller shaft.

b. Drive Control

① The pick-up roller is rotated by the drive of the pick-up motor (M4) coming by way of gears. The cassette pick-up motor rotates clockwise or counterclockwise to drive the upper/lower cassette.

② When the cassette pick-up motor rotates clockwise, the rotation of the motor moves up the gear 1 to drive the pick-up roller of the upper cassette; when the motor rotates counterclockwise, on the either hand, the gear 1 moves down to drive the pick-up roller of the lower cassette. See Figure 3-609 for how the pick-up roller is driven.

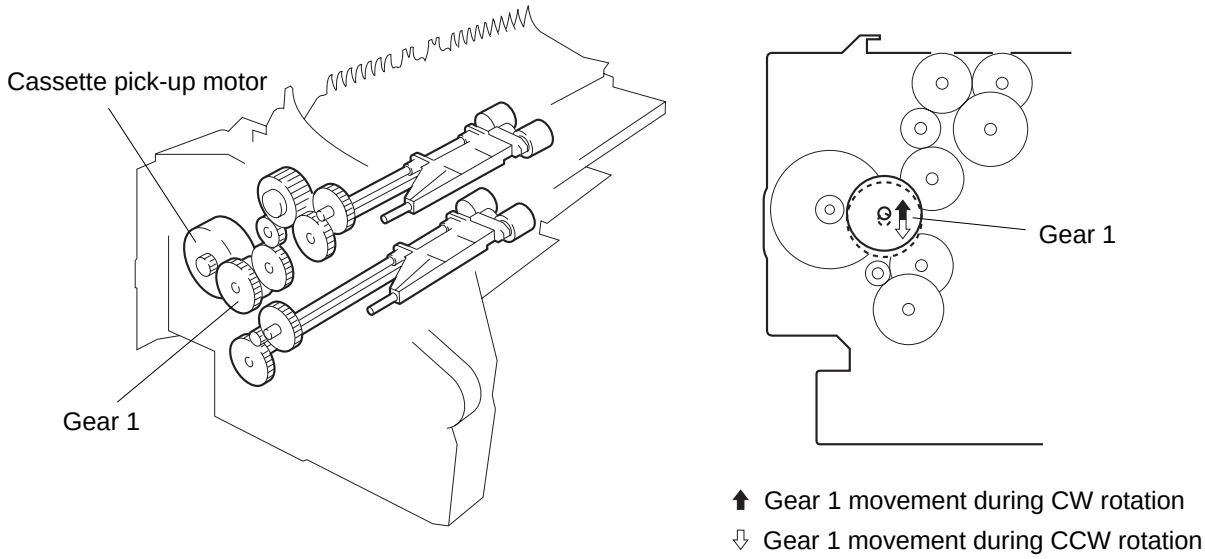

Figure 3-609 Movement of Gear 1 in Relation to the CW/CCW Rotation of the Cassette Pick-Up Motor (M4)

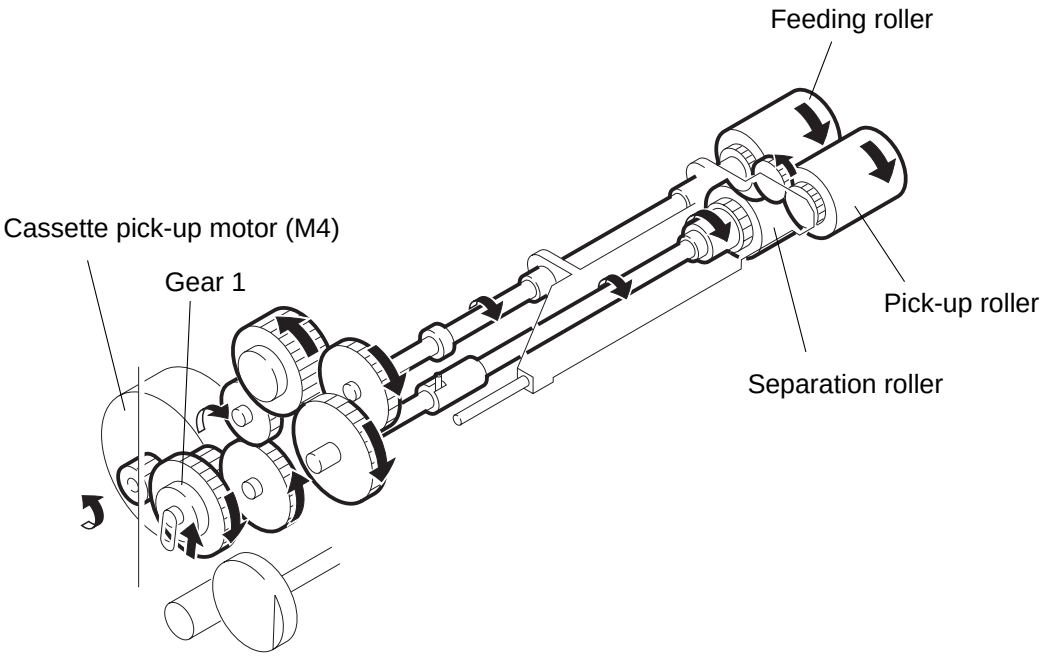

Figure 3-610 Pick-Up Drive for the Upper Cassette (pick-up motor rotating CW)

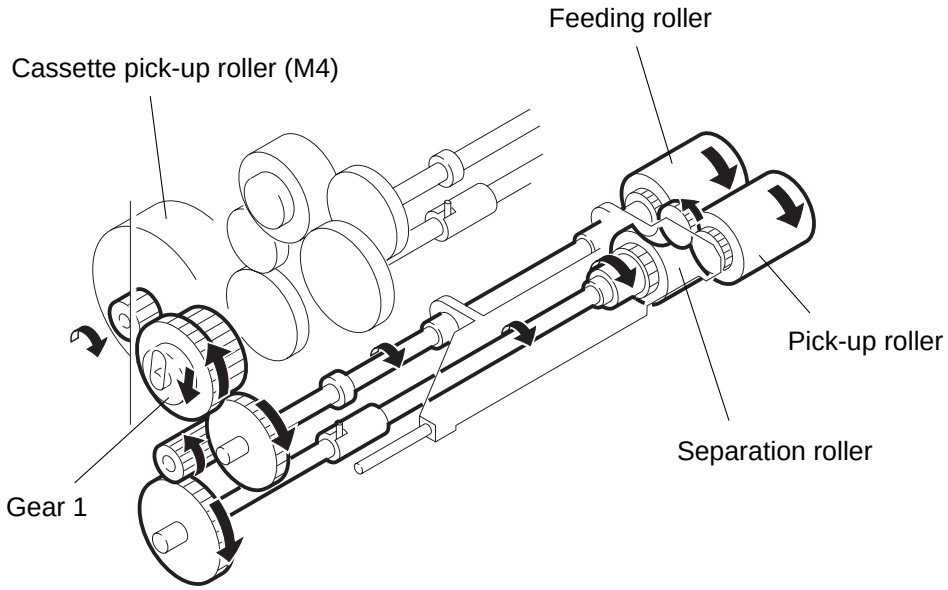

Figure 3-611 Pick-Up Drive for the Lower Cassette (pick-up motor rotating CCW)

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c. Moving Up/Down (pick-up) the Pick-Up Roller

The pick-up roller and the feeding roller are supported by a roller holder, and the pick-up roller operates around the feeding roller shaft. The up/down movement of the pick-up roller shaft is driven using the drive of the main motor (M1) through the cam 1 controlled by the pick-up solenoid (SL2).

In standby, the pick-up roller shaft is at uppermost position. The following operations take place when picking up a single sheet of copy paper:

1. When the pick-up solenoid (SL2) turns ON, the drive of the main motor (M1) causes the cam 1 to make a single rotation.
2. The single rotation of the cam causes the pick-up lever to swing.
3. As the lever swings, the pick-up roller shaft lowers once to come into contact with the copy paper, and the drive of the pick-up motor (M4) is used to pick-up a single sheet of paper.
4. The rotation of the cam 1 raises the pick-up roller shaft.

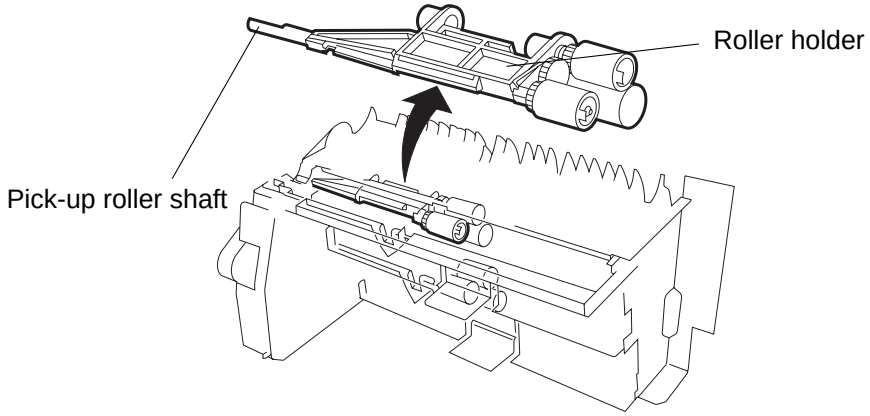

Figure 3-612 Arrangement of the Pick-Up Roller

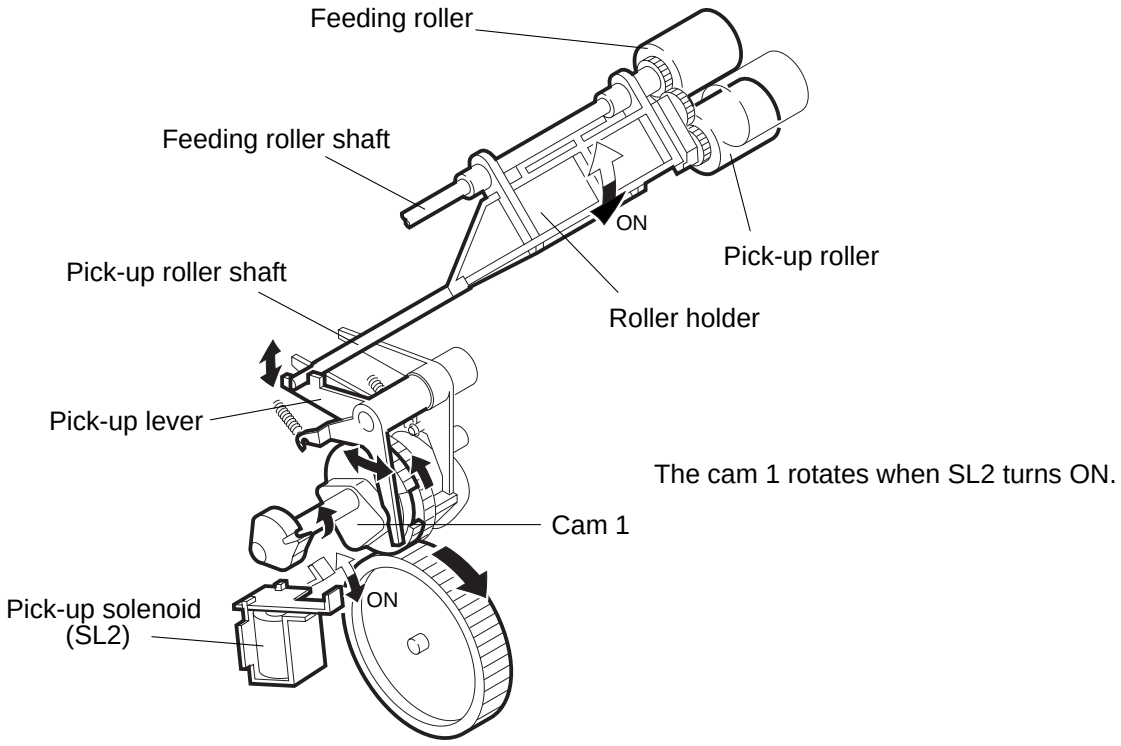

Figure 3-613 Up/Down Movement of the Pick-Up Roller Shaft

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d. Detecting the Absence of Paper inside the Cassette

When the cassette runs out of copy paper, the paper detecting lever falls through the detecting slit in the cassette. The paper detecting lever operates in conjunction with the light-blocking plate so that the light-blocking plate blocks the respective photointerrupter (Q1604 for the upper cassette; Q1605 for the lower cassette), thereby indicating the absence of paper inside the cassette. Figure 3-614 shows the state in which the cassette has run out of copy paper.

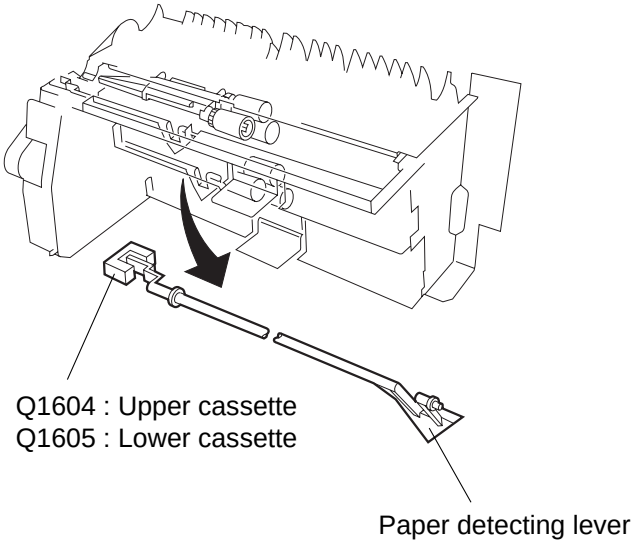

Figure 3-614 Arrangement of the Paper Detecting Lever

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C. Non-Pick Up Operation (standby)

The machine operates as follows when the cassette is slid into or out of the machine.

1. Lifter Up/Pick-Up Roller Shaft Down (sliding in the cassette)

a. Pick-Up Roller Shaft Down

When the cassette is installed while the main power supply is ON, the following cause the pick-up roller shaft to lower until it comes into contact with the surface of the copy paper:

- The rear end of the cassette pushes in the lever 1 of the pick-up unit mechanically.
- The main motor (M1) and the pick-up solenoid (SL2) turn ON in response to the activation of the cassette size sensor, causing the pick-up lever to swing.

■ The pick-up roller shaft is subject to control by the lever 1 and the pick-up lever.

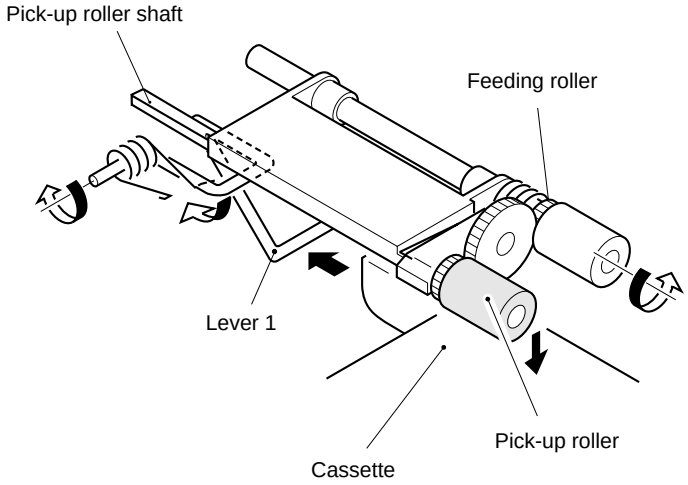

Figure 3-615 Movement of the Lever 1 When the Cassette is Slid In

b. Lifter Up

When the main power is turned ON with the cassette inside the machine or the cassette is slid in during standby, the pick-up roller shaft lowers to push down the lifter trigger lever.

When one end of the lifter trigger lever is pushed in by the pick-up roller shaft, the drive of the main motor (M1) causes the lifter to rise.

When the pick-up roller shaft, which is in contact with the surface of copy paper, has moved up to a specific height, the movement of the lever returns the pick-up roller shaft to uppermot position, ending the lifter ascent operation.

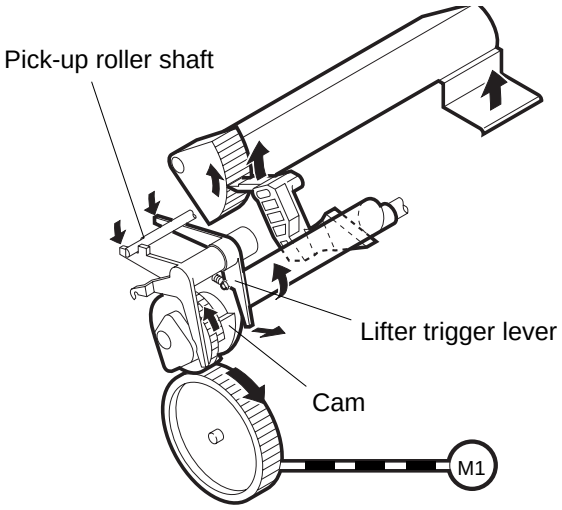

Figure 3-616 Moving Up the Lifter

2. Moving Up the Pick-Up Roller Shaft and Releasing the Lifter/Separation Roller (sliding out the cassette)

a. Moving Up the Pick-Up Roller Shaft and Releasing the Separation Roller

- Moving Up the Pick-Up Roller Shaft
  When the cassette is slid out, the force of the spring rotates the lever 1. The rotation of the lever 1 moves up the pick-up roller shaft s that the pick-up roller and the cassette will not interfere with each other.

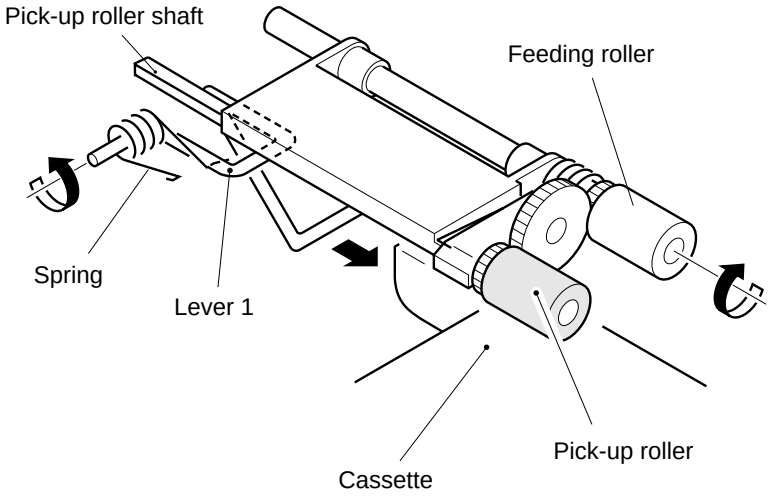

Figure 3-617 Moving Up the Pick-Up Roller

- Releasing the Separation Roller
  A boss is provided on the lever 1 used to push down the separation roller assembly. Since the lever 1 rotates when the cassette is slid out, the pressure between the separation roller and the feeding roller will be released as shown in Figure 3-618.

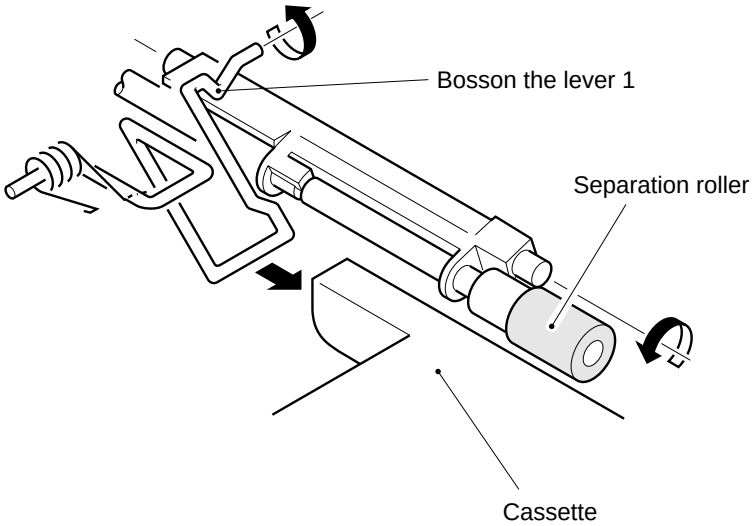

Figure 3-618 Releasing the Separation Roller

b. Releasing the Lifter

The lifter is released when the cassette is slid out during standby.

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D. Detecting the Level of Copy Paper

The machine checks the level of copy paper inside the cassette and indicates the level in four degrees. The level of copy paper inside the cassette is checked in reference to the up movement of the lifter noted when the light-blocking plate blocks the appropriate sensor.

When copy paper starts to run out, the lifter rises gradually;when paper fully runs out, the cassette paper sensor (Q1604 for upper) detects the absence of paper.

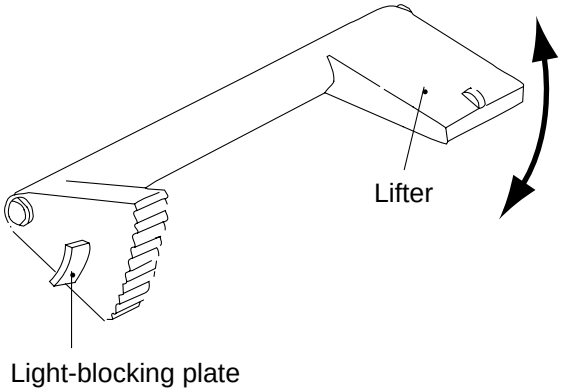


Figure 3-620

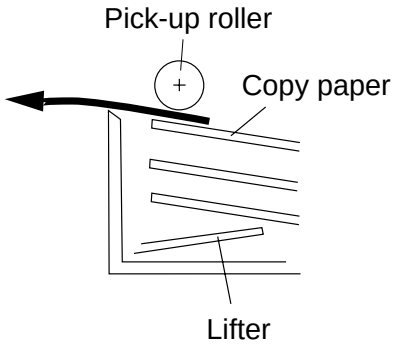
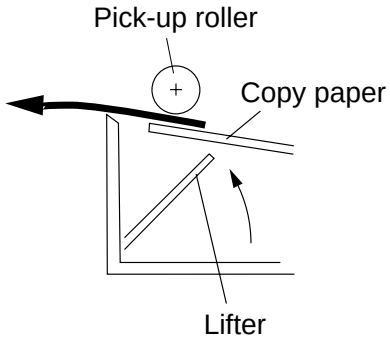
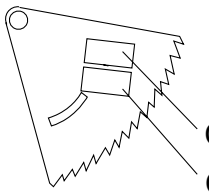
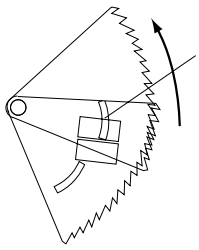
	Full of copy paper	Out of cop paper
Lifter condition		
Gear an level sensor	 (upper cassette)	 Gear when the cassette is full of copy paper

Figure 3-621 Detecting the Level of Paper inside the Cassette (upper)

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Table 3-605 shows the relationship between the level of copy paper as detected and the sensors as well as indications on the control panel.

Level	Q1606	Q1607	Indication on control panel
500 sheets	0	0	
	1	0	
	1	1	
0 sheets	0	1	

1: The light-blocking plate is over the sensor.
0: The light-blocking plate is not over the sensor.

Table 3-605

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E. Detecting the Size of Copy Paper

1. Outline

The size of copy paper is detected by the machine's CPU in reference to the cassette dial set by the user.

See Figure 3-623 for switching between AB- and Inch-configurations. Based on the detected size of copy paper, the machine determines the distance over which to move the scanner and the area of laser exposure.

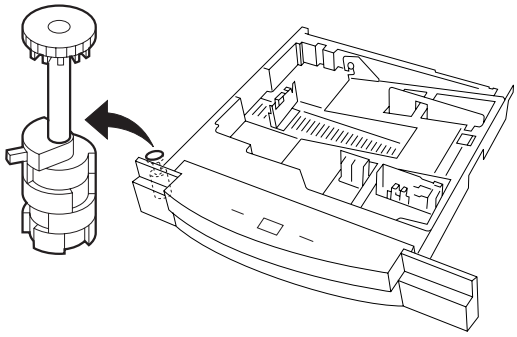

Figure 3-622 Location of the Dial

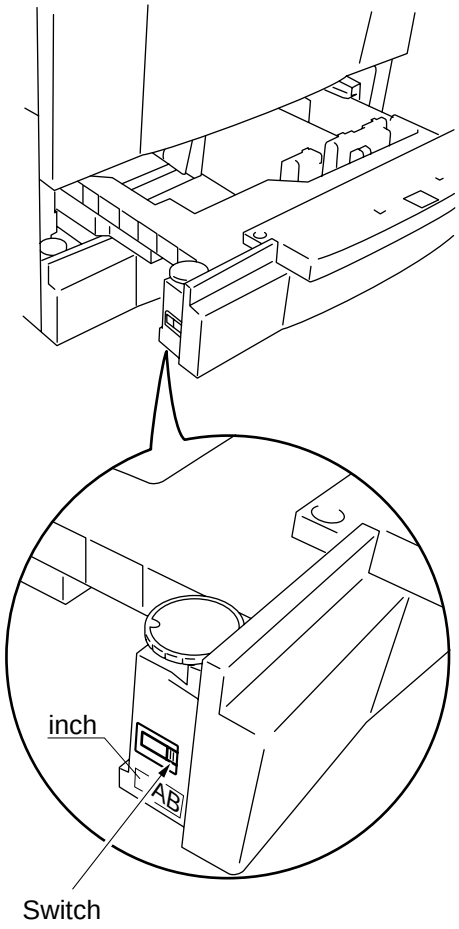

Figure 3-623 AB-/Inch-Configuration Switch

2. Paper Sizes

The size of copy paper is detected by the machine's CPU in reference to the dial on the cassette set by the user. Figure 3-624 shows the rotary label attached to the dial, and Table 3-608 shows the sizes of copy paper which may be used for the machine.

Configuration	Cassette		Main scanning direction (mm)	Sub scanning direction (mm)
AB	A4		210	148
	A5R		148	210
	A4		297	210
	A4R		210	297
	A3		297	420
	B5		257	182
	B5R		182	257
	B4		257	364
	U1	FLSO	216	330
		OFICIO	216	317
		A-OFI	220	340
		E-OFI	220	320
		B-OFI	216	355
		A-LGL	220	340
	U2	FOLIO	210	330
	U3	A-FLS	206	337
	SP-1		Set by user	Set by user
	SP-2		Set by user	Set by user
	ENV1		Set by user	Set by user
Inch	STMT		216	140
	STMTR		140	216
	LTR		279	216
	A-LTR		280	220
	LTRR		216	279
	A-LTRR		220	280
	LGL		216	356
	11 × 17		279	432
	U4		267	203
	U5		203	267
	U6		203	330
	U7		268	190
	U8		190	268
	SP-3		Set by user	Set by user
	SP-4		Set by user	Set by user
	ENV2		Set by user	Set by user

Table 3-606 Copy Sizes

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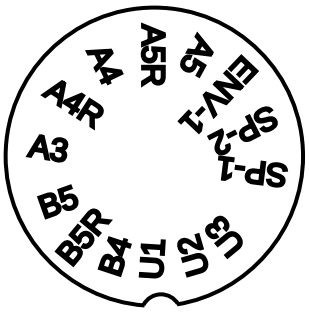
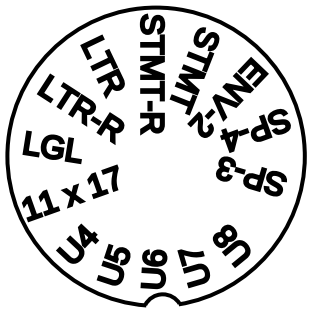


A/B-Configuration Rotary Label



Inch-Configuration Rotary Label

A/B-Configuration Rotary Label

Inch-Configuration Rotary Label

Figure 3-624 Rotary Labels

Note 1:

The notation U is in reference to the following:

U1 .....FOOLSCAP	U2 .....FOLIO	U8 .....K-LGL (R)
OFFICIO	U3 .....A-FLS	
A-OFFICIO	U4 .....G-LTR	
E-OFFICIO	U5 .....G-LTR (R)	
B-OFFICIO	U6 .....G-LGL	
A-LGL	U7 .....K-LGL	

Note 2:

The notation SP-1/2 (special 1/2) is in reference to modes which may be used after registering default sizes of the user's choice in user mode. An icon may be selected to represent the SPECIAL cassette for display on the control panel. For details, see the Operator's Manual.

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Note 3:
The notation ENV 1/2 (envelope 1/2) is in reference to a mode in which five types of envelopes may be registered. If the option envelope kit is not installed to the uppermost cassette, the machine will not feed envelopes.

Type	Shorter side (X) × Longer side (Y)
COM10	104.7 × 241.3 (mm)
Monarch	98.4 × 190.5 (mm)
DL	110 × 220 (mm)
C5	162 × 229 (mm)
B5	176 × 250 (mm)

Table 3-607 Envelope Sizes

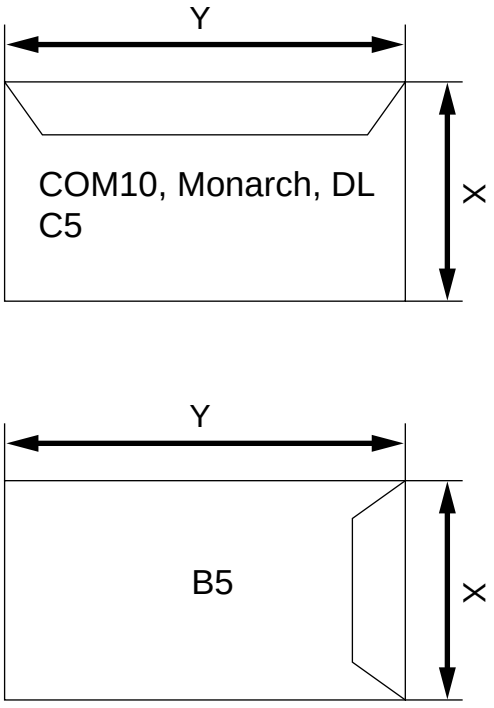

Figure 3-625 Shape of Envelope

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3. Cassette Size

The upper cassette and the lower cassette differ in size. The upper cassette may be used for copy paper of B4 or smaller.

Inside the cassette are the side guide plates (side/rear end), which must be adjusted by hand. Since the size guide plates are not equipped with a sensor, you must set the aforementioned rotary switch correctly.

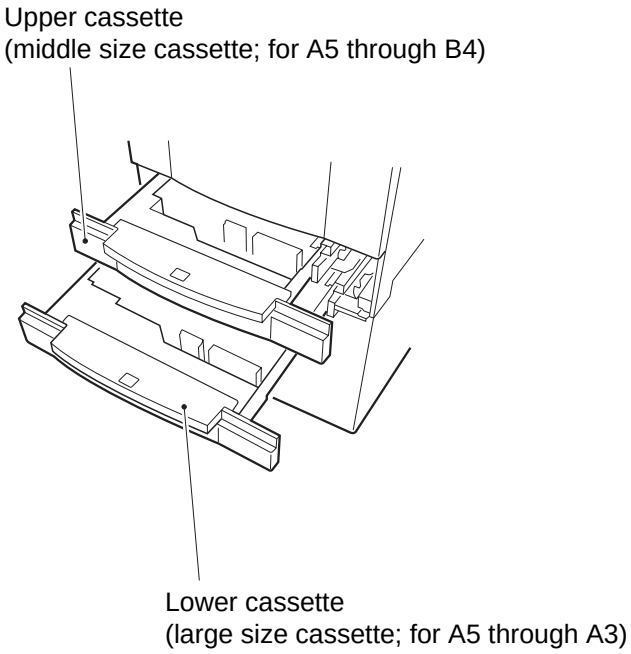

Figure 3-626 Upper/Lower Cassette Size

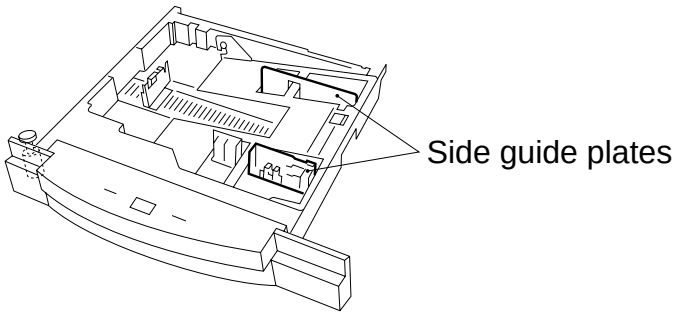

Figure 3-627 Side Guide Plate

F. Multifeeder

1. Outline

The multifeeder is a mechanism in which a stack of copy paper placed on the multifeeder tray is picked up one by one from the top.

The copy paper stacked on the tray is pushed against the pick-up roller by the paper guide. The drive of the multifeeder pick-up roller comes from the main motor (M1) through the multifeeder pick-up clutch (CL2).

The multifeeder pick-up roller and the separation pad make sure that only one sheet of copy paper is picked up and fed to the registration roller. This series of operations is repeated for each pick-up operation.

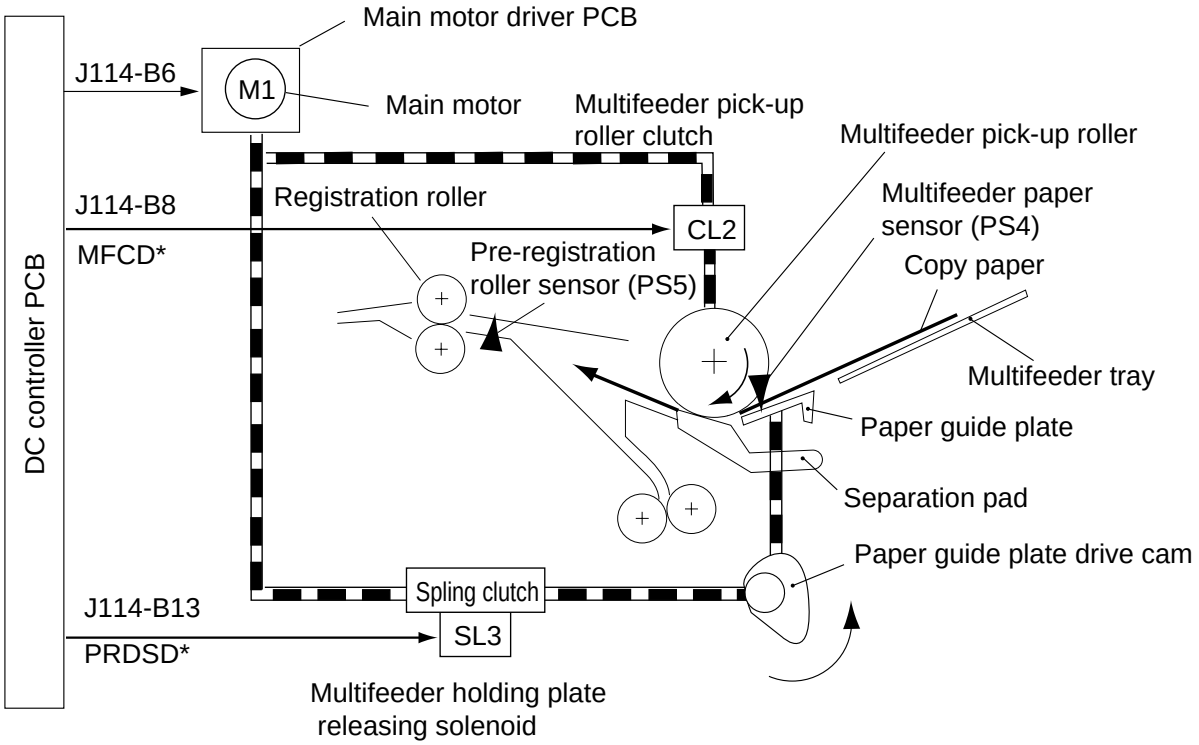

Figure 3-627-1

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2. Detecting the Size of Copy Paper in the Multifeeder

■ Detecting the Width of Paper

The width of copy paper is detected by the variable resistor (VR1751) operating in conjunction with the movement of the slide guide. The slide guide settings are registered when the user makes adjustments for the copy paper set on the multifeeder tray.

■ Rear/Front Registration

The rear/front registration for pick-up in the multifeeder is by adjusting the screw on the slide guide. For details, see the Service Handbook.

■ Detecting the Length of Paper

The length of paper is detected in reference to how long the pre-registration sensor (PS5) remains ON during copying. The maximum size of copy paper is 432 × 279 mm (11" × 17").

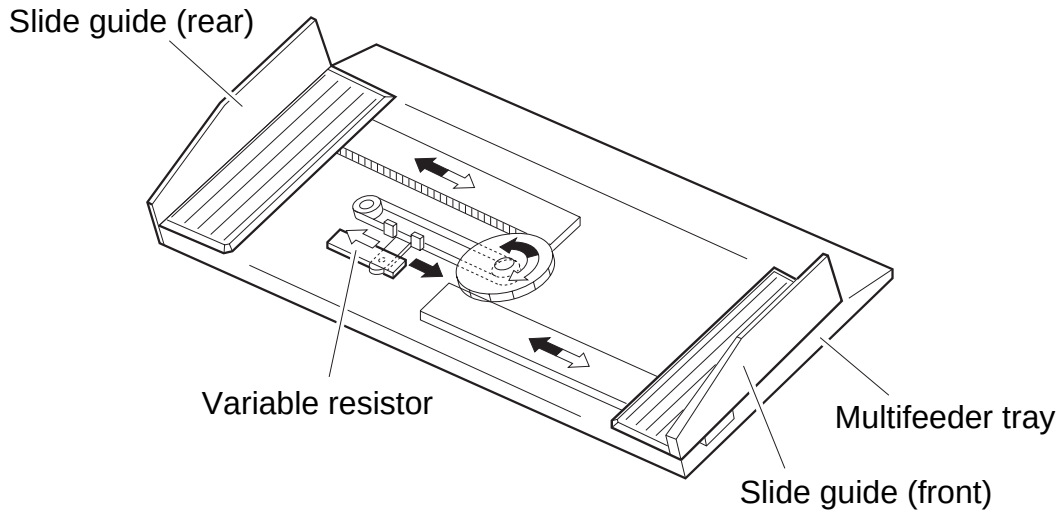

Figure 3-627-2

3. Sequence of Pick-Up Operations (multifeeder; A4, 2 copies)

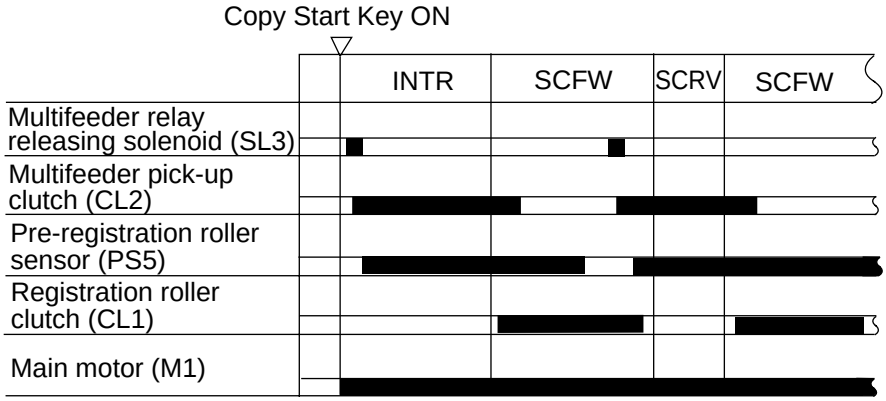

Figure 3-627-3

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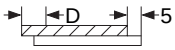
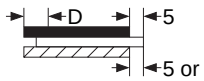
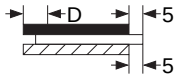
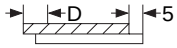
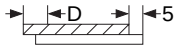
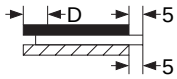
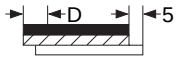
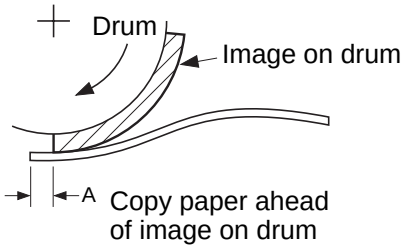
G. Controlling the Registration Roller Clutch

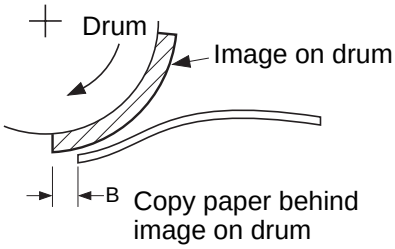
The registration roller clutch (CL1) controls copy paper so that it matches with the image on the drum at a specific location.

You may change the timing at which the registration roller clutch turns ON in service mode (*3*; RESIST).

Selected mode		Copy paper	Shift (mm)	Copy paper on copy tray
one-sided original → one-sided copy		B	May be between 0 and 20 mm; the figures assume a shift of 5 mm.	
one-sided original ↓ two-sided copy	copying on 1st side	A		
	copying on 2nd side	B		
two-sided original ↓ two-sided copy	copying on 1st side	A		
	copying on 2nd side	B		
two-sided original ↓ one-sided copy	copying on 1st side	B		
	copying on 2nd side	B		
page separation (one-sided copy)	copying on 1st side (left)	B		
	copying on 2nd side (right)	B		
page separation ↓ two-sided copy	copying on 1st side (let)	A		
	copying on 2nd side (right)	B		
one-sided original ↓ overlay copy	copying on 1st side	B		
	copying on 2nd side	B		
two-sided original ↓ overlay copy	copying on 1st side	B		
	copying on 2nd side	B		
page separation ↓ overlay copy	copying on 1st side (left)	B		
	copying on 2nd side (right)	B		

Copy paper Image area when copying on 1st side
Image area when copying on 2nd side D area: Erased by blank exposure lamp





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H. Making Overlay Copies

1. Outline

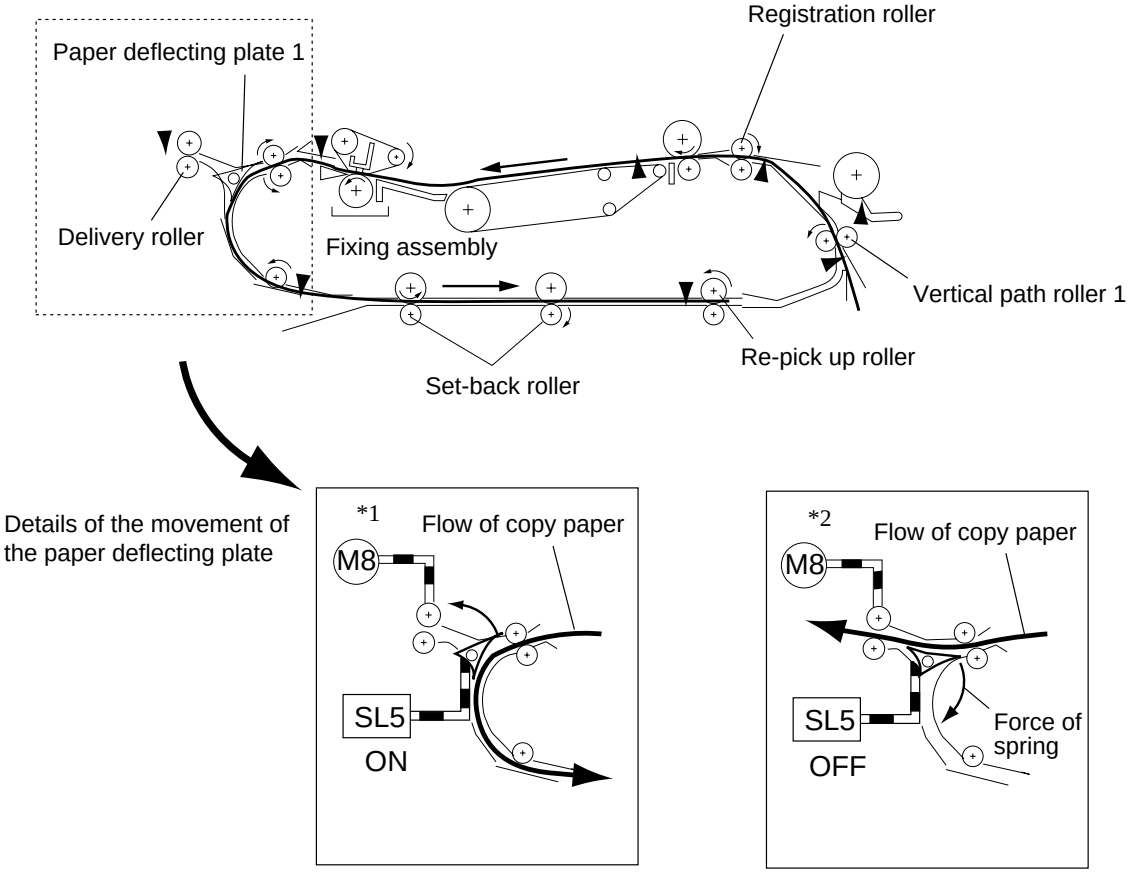
Figure 3-628-1 shows the paper path used to make overlay copies.

Copy paper that has moved through the fixing assembly is sent to the lower feeding assembly by the movement of the paper deflecting plate*. In the lower feeding assembly, the set-back roller puts the incoming sheet in a staggered stack and waits for the next sheet.

When picked up from this stack (re-pick up), copy paper is discharged by the movement of the paper deflecting plate 1**.

* The paper deflecting plate 1 solenoid (SL5) turns ON to rotate the paper deflecting plate 1 counterclockwise.

** The paper deflecting plate 1 solenoid (SL5) turns OFF so that the paper deflecting plate 1 is restrained by the force of the spring.



< Pulling into the lower feeding assembly for reversed delivery when copying on the 1st side of an overlay copy >

< Copying on the 1st side of a two-sided copy when delivering the last copy >

Figure 3-628-1

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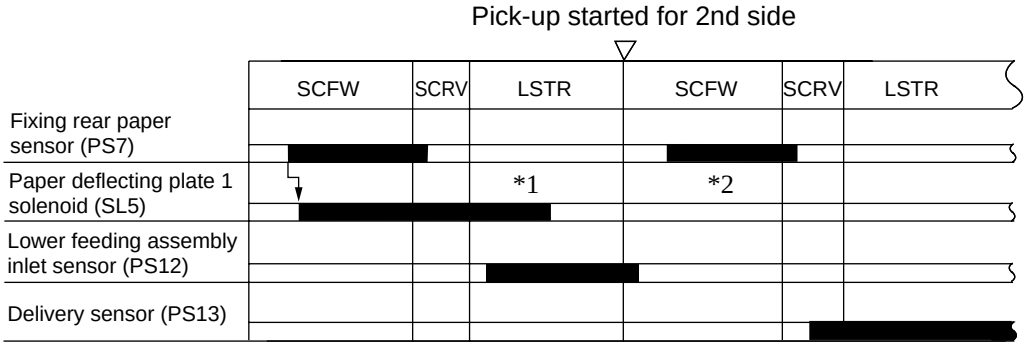
2. Sequence of Operations (overlay copying)

Copy paper is discharged of sent to the lower feeding assembly by switching the feeding path by the paper deflecting plate 1.

The feeding patch is witched by turning ON and OFF the paper deflecting plate 1 solenoid 1 (SL5). The paper deflecting solenoid 1 (SL5) turns ON a specific period of time after copy paper has moved past the fixing rear paper sensor (PS7). See Figure 3-628-2 for the sequence of operations used for overlay copying and Table 3-609 for the relationship between electrical parts and the DC controller PCB.



*1 : Copy paper to the lower feeding assembly.
*2 : Copy paper to the delivery assembly.

Figure 3-628-2

Electrical parts	Signal	Signal	Jack
Fixing rear paper sensor	PS7	PDP3	J109-6
Paper deflecting plate 1 solenoid	SL5	DFLD*	J105-A5
Lower feeding assembly inlet sensor	PS12	PDP6*	J105-B2
Delivery sensor	PS13	PDP7*	J105-A2

Jack in the signal line on the DC controller PCB.

Table 3-608

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I. Making Two-Sided Copies

1. Outline

Figure 3-629 shows the paper path used when making two-sided copies.

For the first side of a two-sided copy, the copy paper is moved to the delivery side once after it has been moved through the fixing assembly. When the copy paper moves past the delivery sensor (PS7), the delivery roller reverses after a specific period of time*. The delivery roller motor (M8) turns ON a specific period of time after copy paper has moved past the fixing paper sensor (PS7).

For the second side of a two-sided copy, the delivery roller rotates clock wise**; then, the copy paper is discharged.

	Two-sided		Overlay	
	1st side	2nd side	1st side	2nd side
Paper deflecting plate 1 solenoid (SL5)	OFF	OFF	ON	OFF
Delivery roller motor (M8)	CW ↓ CCW	CW	OFF	CW

Table 3-609

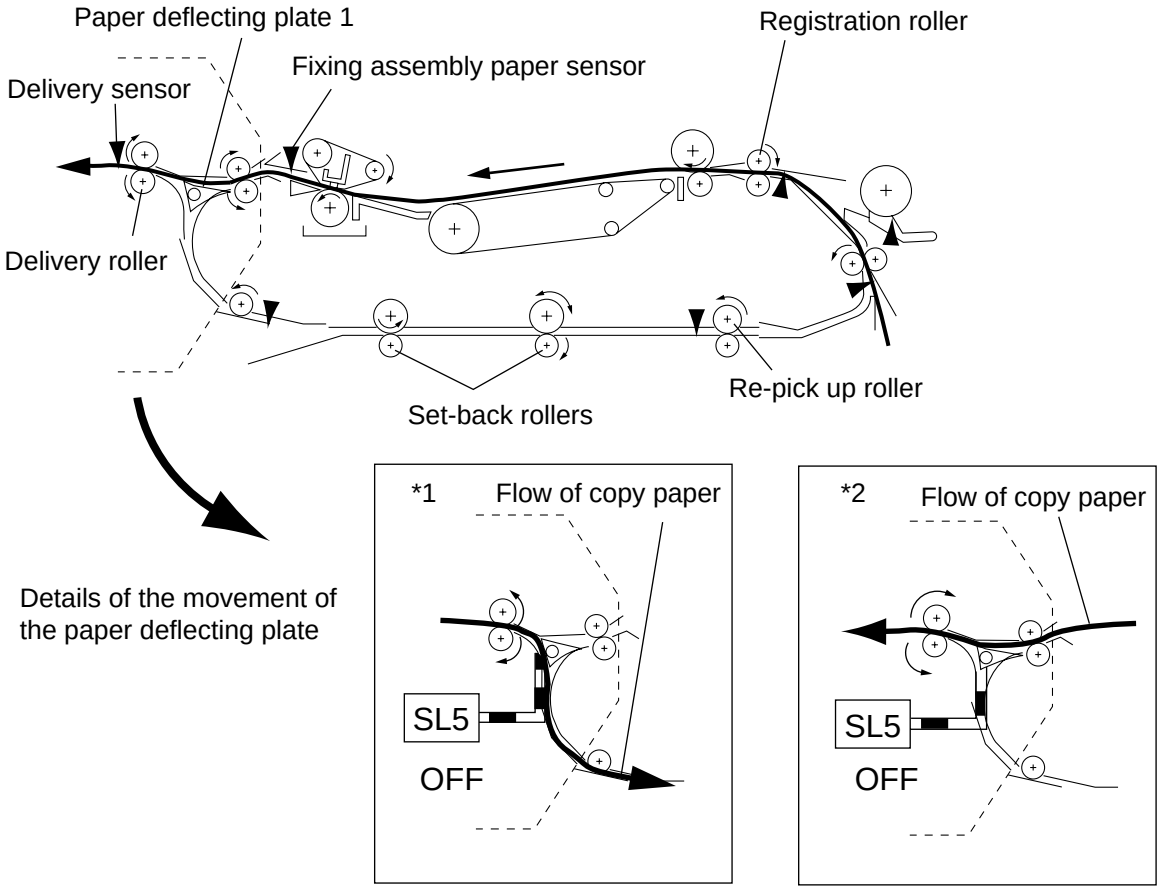

Figure 3-629

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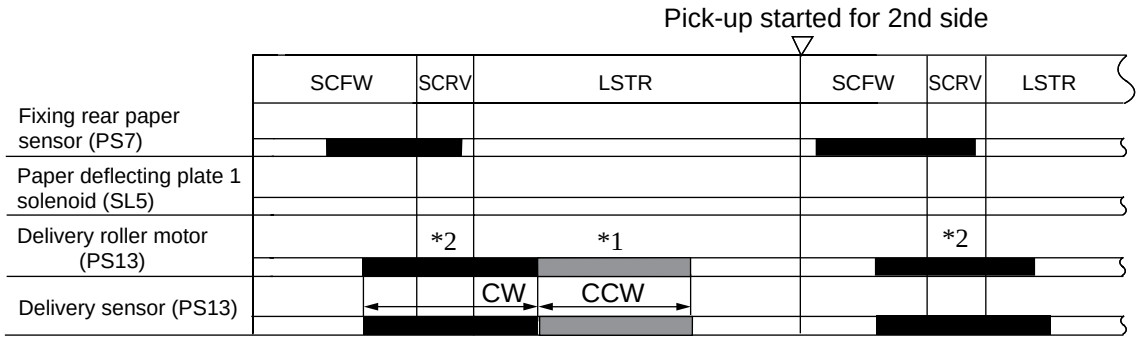
2. Sequence of Operations (two-sided copying)

When copying on the first side of a two-sided copy, copy paper is first fed to the delivery assembly; after a specific period of time, the delivery roller is rotated in reverse to move the paper to the lower feeding assembly.

The delivery roller is rotated in reverse a specific period of time after the leading edge of copy paper has moved past the delivery sensor. Figure 3-630 shows the sequence of operations when making two-sided copies.



*1 : Copy paper is moved to the lower feeding assembly.
*2 : Copy paper is moved to the delivery assembly.

Figure 3-630

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J. Lower Feeding Assembly

1. Outline

The sheets of copy paper moved to the lower feeding assembly for two-sided/overlay copying are stacked in a staggered pattern by the set-back method and re-picked up for copying on the second side.

In the set-back mechanism, sheets of copy paper are stacked in a staggered pattern so that double feeding may be avoided within limited space.

Parts name	Notation
Main motor	M1
Set-back roller motor	M6
Lower feeding assembly inlet motor	M7
Re-pick up front paper sensor	PS11
Lower feeding assembly inlet paper sensor	PS12
Re-pick up flapper drive solenoid	SL4
Lower feeding assembly re-pick up clutch	CL5

Table 3-610 Names of Electrical Parts

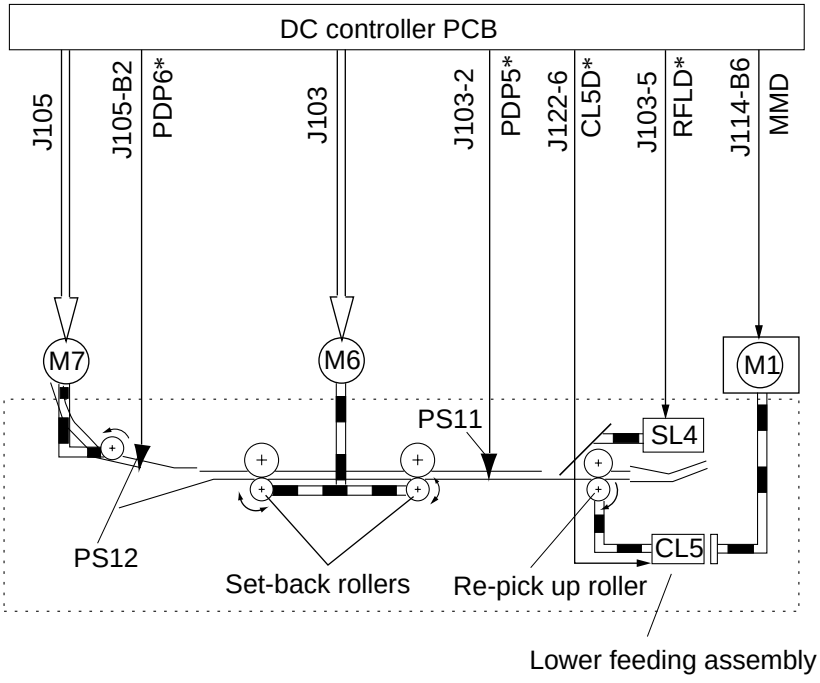

Figure 3-631

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Sizes	Q'ty	Paper sizes (mm; main × sub scanning directions)
LTR	20	179.40 × 215.90
A4	20	297.00 × 210.00
G-LTR	20	266.70 × 203.20
K-LGL	20	268.00 × 290.00
B5	20	257.00 × 182.00
A5	20	210.00 × 148.50
STMT	20	215.90 × 139.70
Others*	1	

* AB ; A3, A4, A4R, B5R, A5R
Inch ; 11 × 17, LGL, B-OFFI, A-OFFI, A-LGL, AUS-FLS, FOOLSCAP, FOLIO, G-LGL, E-DFFI, OFFICIO, A-LTRR, LTRR, K-LGLR, G-LTTR, A-LTR, STMTR

Table 3-611 Accommodating Paper in the Lower Feeding Assembly

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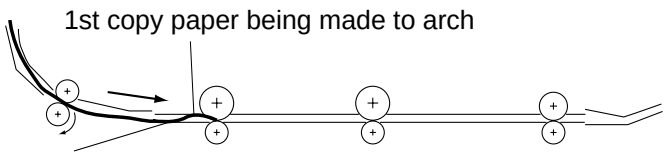
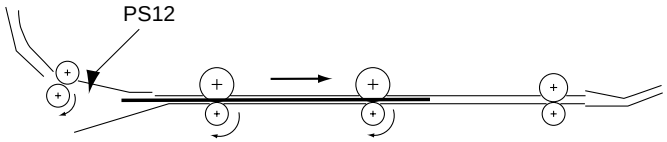
2. Set-Back Operations

a. Stacking Operation (copying on 1st side)

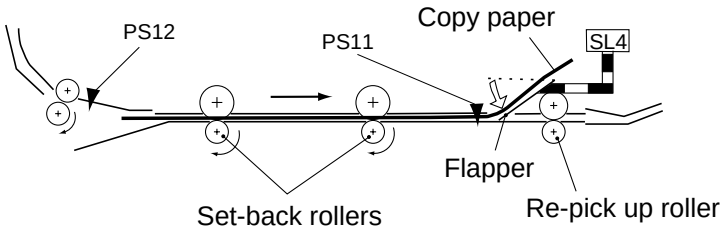
1) Copy paper is moved to the lower feeding assembly and is arched.



2) The set-back roller rotates clockwise to feed the copy paper until it moves past the lower feeding assembly inlet sensor.



3) If the copy paper is A4 or larger, SL4 operates the flapper to prevent the copy paper from moving to the re-pick up roller.



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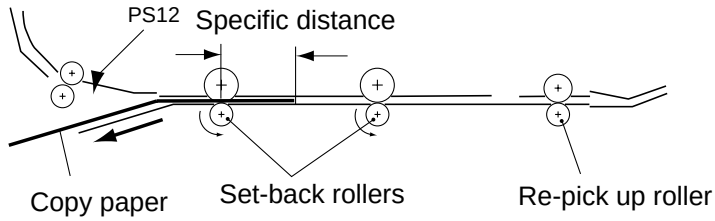
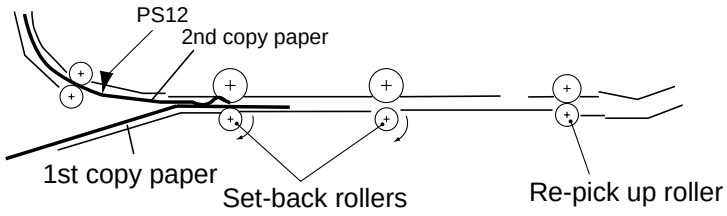
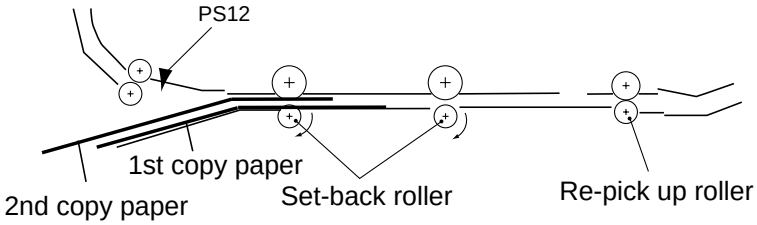
4) The set-back rollers are rotated in reverse to move and stop the copy paper to and at a specific position.



5) The 2nd copy paper is fed to the lower feeding assembly.



6) The copy paper is moved in the same way the 1st copy paper was moved.



By repeating the above operations, as many as 20 sheets of copy paper are stacked in the lower feeding assembly (i.e., 20 sheets of LTR, A4, G-LTR, K-LGL, B5, A5, or STMT).

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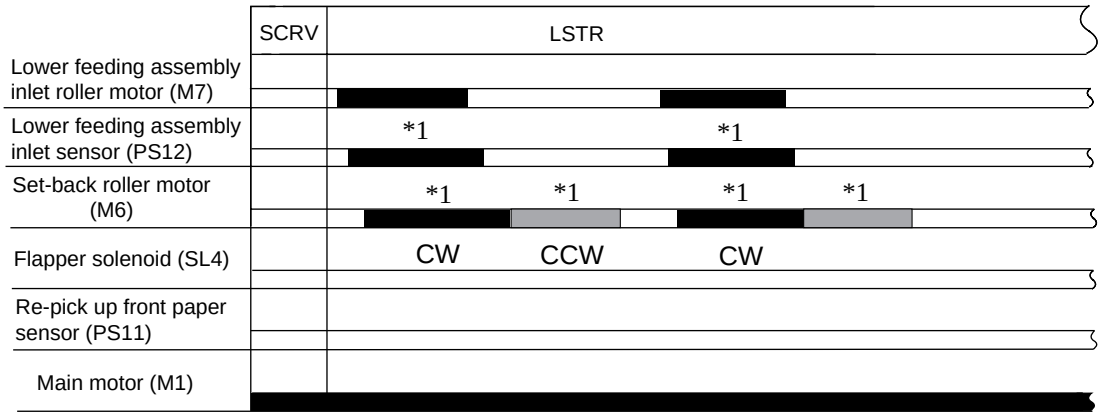
Figure 3-632 shows the sequence of operations used to stack sheets of copy paper in a staggered pattern.



*1 : Varies according to the length of copy paper.

Figure 3-632 (A4, 2 copies, Direct, two-sided/overlay)

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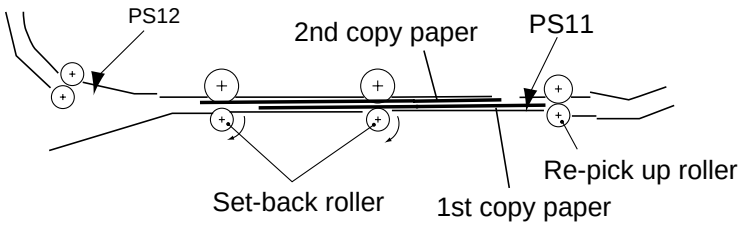
b. Re-Pick Up Operations (copying on the 2nd side)

The sheets of copy paper stacked in the lower feeding assembly after copying on the first side are picked up by the re-pick up roller for copying on the second side.

1) When stacking is over, the set-back roller is moved clockwise, and the copy paper is moved until the re-pick up sensor (PS11) detects the leading edge.



2) The copy paper is continuously moved; since the re-pick up flapper solenoid (SL4) turns ON a specific period of time after the re-pick-up paper sensor (PS11) turns ON, only the first sheet moves through the re-pick-up roller and the second and subsequent sheets will be moved to on the flapper plate.

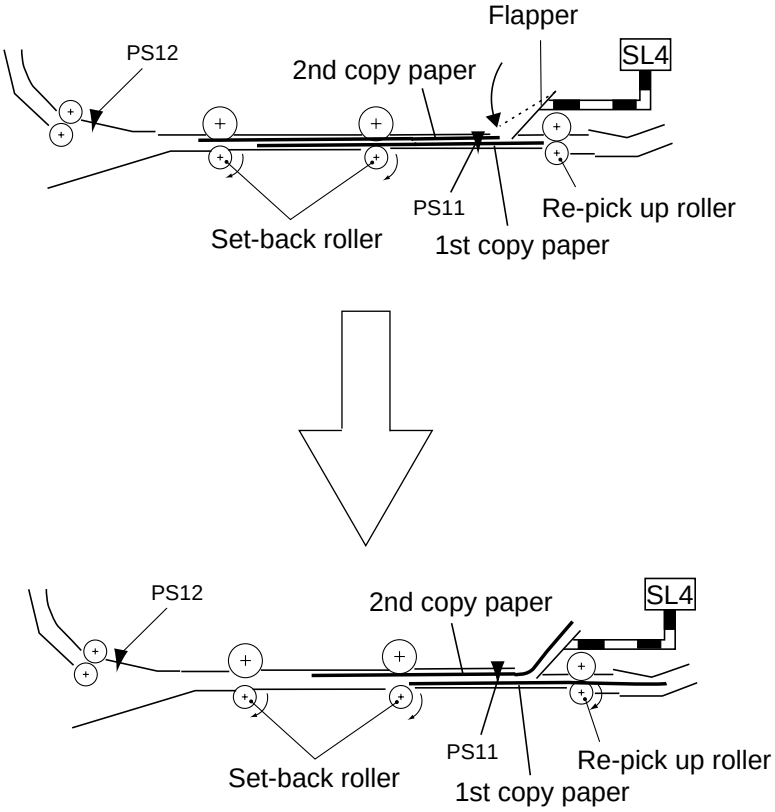


Figure 3-633

3) When the trailing edge of the first copy paper moves past the set-back roller, the set-back roller rotates in reverse to move the copy paper to a point where the leading edge of the next copy paper will not reach the re-pick up sensor (PS11).

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3. Rear/Front Registration

a. Outline

- The sheets of copy paper in the lower feeding assembly are picked up without alignment for rear/front direction, requiring detecting of a rear/front displacement while being fed. The rear/front registration detection mechanism is used for sheets picked from the lower feeding assembly.
- The rear/front registration detecting assembly is located near the vertical path roller assembly and consists of the horizontal registration sensor (PS14) and the horizontal registration motor (M9).
- The horizontal registration motor (M9) is used to drive the horizontal registration sensor (PS14); the movement of the horizontal registration sensor is used to detect the edge of paper, and the result is used to determine the position of laser exposure.

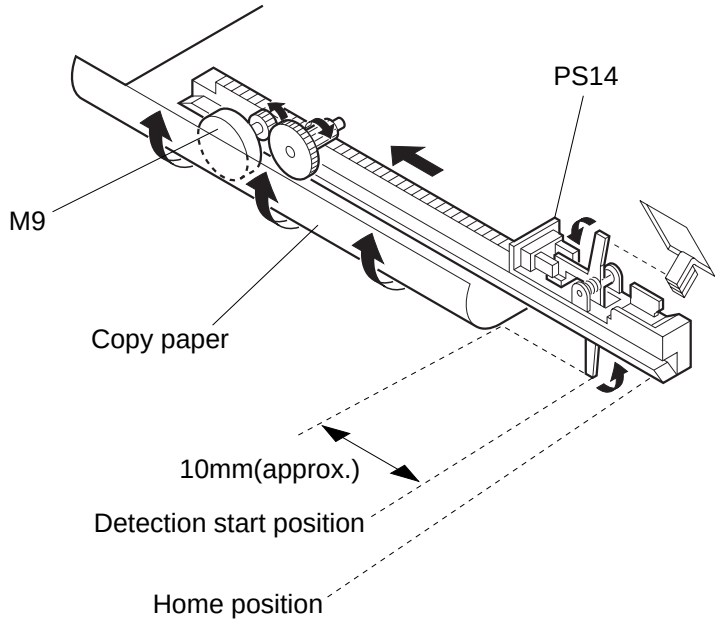

Figure 3-634

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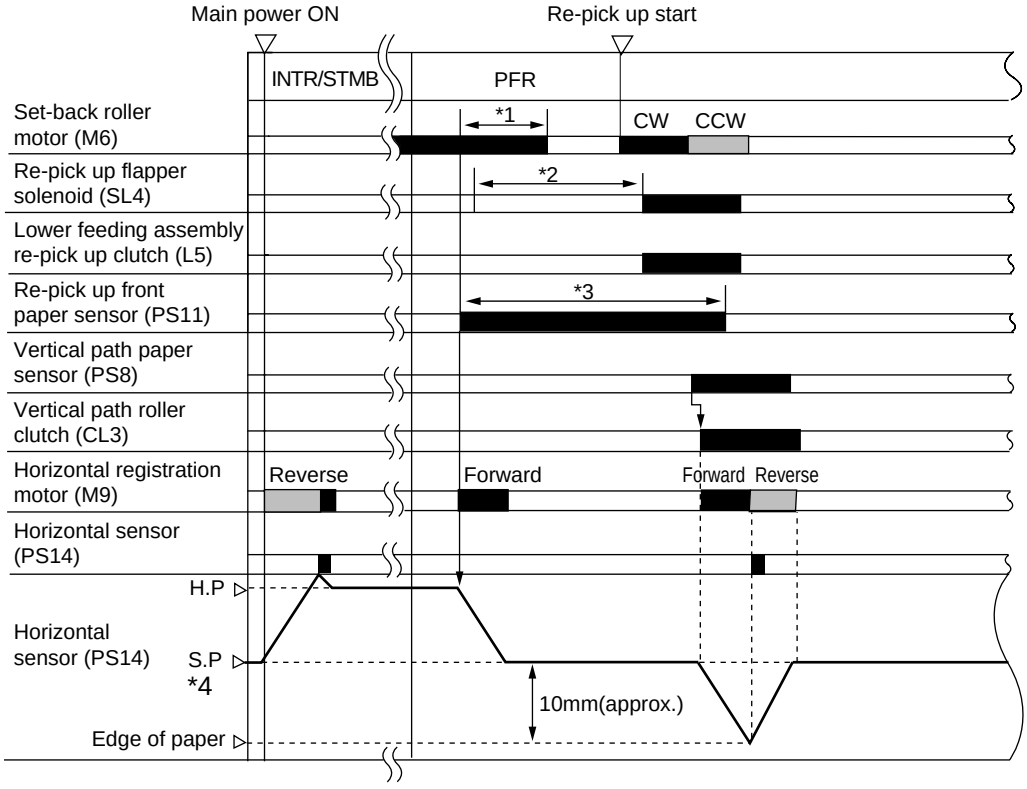
b. Operations

The home position of the horizontal registration sensor (PS14) is checked when 24 VDC is supplied (i.e., when the front cover is closed after power-on), and the movement is started when paper is stacked in the lower feeding assembly at detection start position.

When the copy paper picked up from the lower feeding assembly reaches the vertical path paper sensor (PS8), the horizontal registration motor (M9) turns ON and the horizontal registration sensor (PS14) operates to check the edge of the paper. (The detection is executed each time paper is picked up from the lower feeding assembly.)

Detection start position differs for each copy paper; ideally, it is set to a point about 10 mm from the edge of the paper being moved. (The factors determining the detection start position are the cassette size and the slide guide of the multifeeder assembly.

Figure 3-635 shows the sequence of operations for rear/front registration detection.



1: The set-back roller motor may turn ON/OFF depending on the copy count.
2: The re-pick up flapper solenoid may turn ON depending on the copy count.
3: The re-pick up sensoer may turn ON/OFF during set-back operation depending on the copy count
4: The edge of the paper is detected; a checkis made when the light-blocking plate is away.
5: The paper edge position differs depending on copy paper size, making SP different.
HP: Home position of the horizontal registration sensor.
SP: Detection start position of the horizontal sensor.

Figure 3-635

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Figure 3-636 and Table 3-612 show the electrical parts associated with rear/front registration detection.

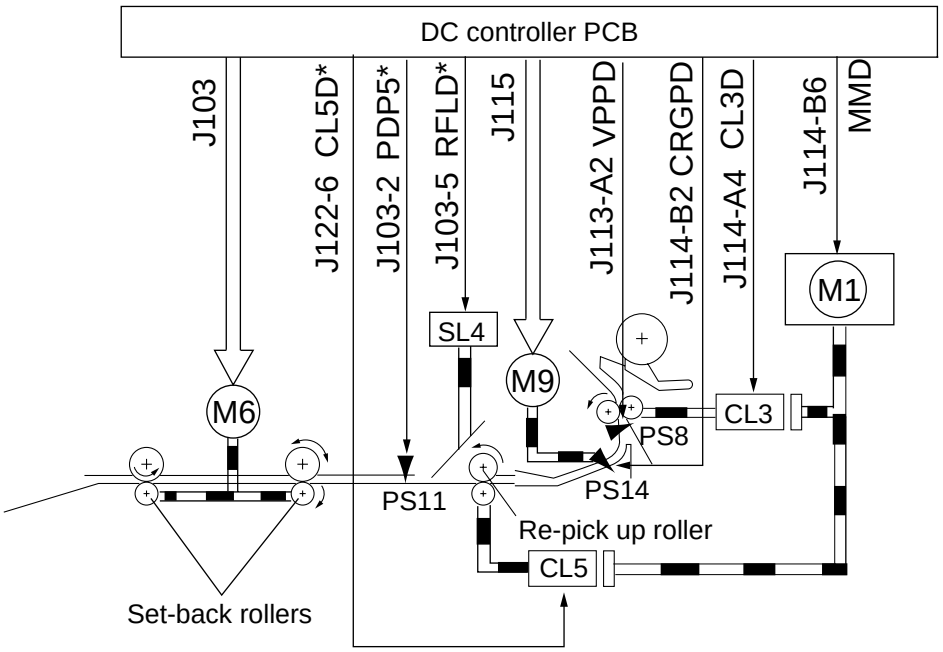

Figure 3-636

	Electrical parts
M1	Main motor
M6	Set-back roller motor
M9	Horizontal registration motor
CL3	Vertical path clutch
CL5	Lower feeding assembly re-pick up clutch
SL4	Re-pick up paper deflecting solenoid
PS8	Vertical path sensor
PS11	Re-pick up sensor
PS14	Horizontal registration sensor

Table 3-612

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c. Adjusting Horizontal Registration (service mode)

Adjust the horizontal registration in 'RSID-SNSHP' (4th screen) of 'ADJUST' in service mode (*3*) if a discrepancy occurs in rear/front direction during pick-up for copying on the second side of an overlay/two-sided copy.

In this adjustment, the position of the horizontal registration sensor electrically stored in memory is shifted, thereby moving the position of laser exposure. (This is not to physically move the position of the sensor.)

- If the image is displaced to the rear, decrease the value.

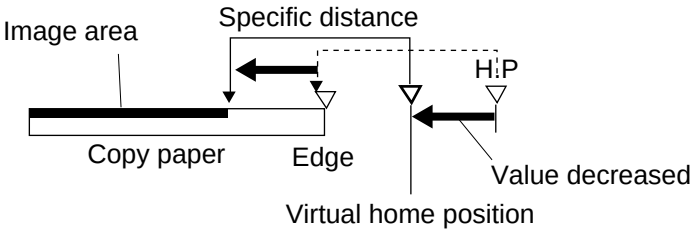

Figure 3-637

- If the image is displaced to the front, increase the value.

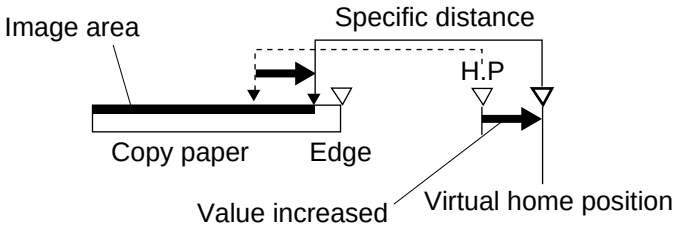

Figure 3-638

K. Fixing/Delivery Assembly

1. Outline

The drive roller of the fixing assembly is driven by the main motor (M1).

When the drive roller rotates, the fixing film rotates, thereby rotating the lower fixing roller.

Part of the inner side of the fixing film is heated by the fixing heater.

The temperature of the fixing heater is checked by the thermistor (TH1), and the result is sent to the microprocessor on the DC controller PCB as the fixing heater temperature detection signal (TH1).

Based on the TH1 signal, the microprocessor on the DC controller PCB varies the fixing heater drive signal (HTRD) to control the temperature of the fixing heater.

The rear end of the fixing heater is also equipped with a thermistor (TH2) to check for overheating of the end.

The machine is designed as such that the pressure between the film and the lower roller of the fixing assembly is released when the front door is opened.

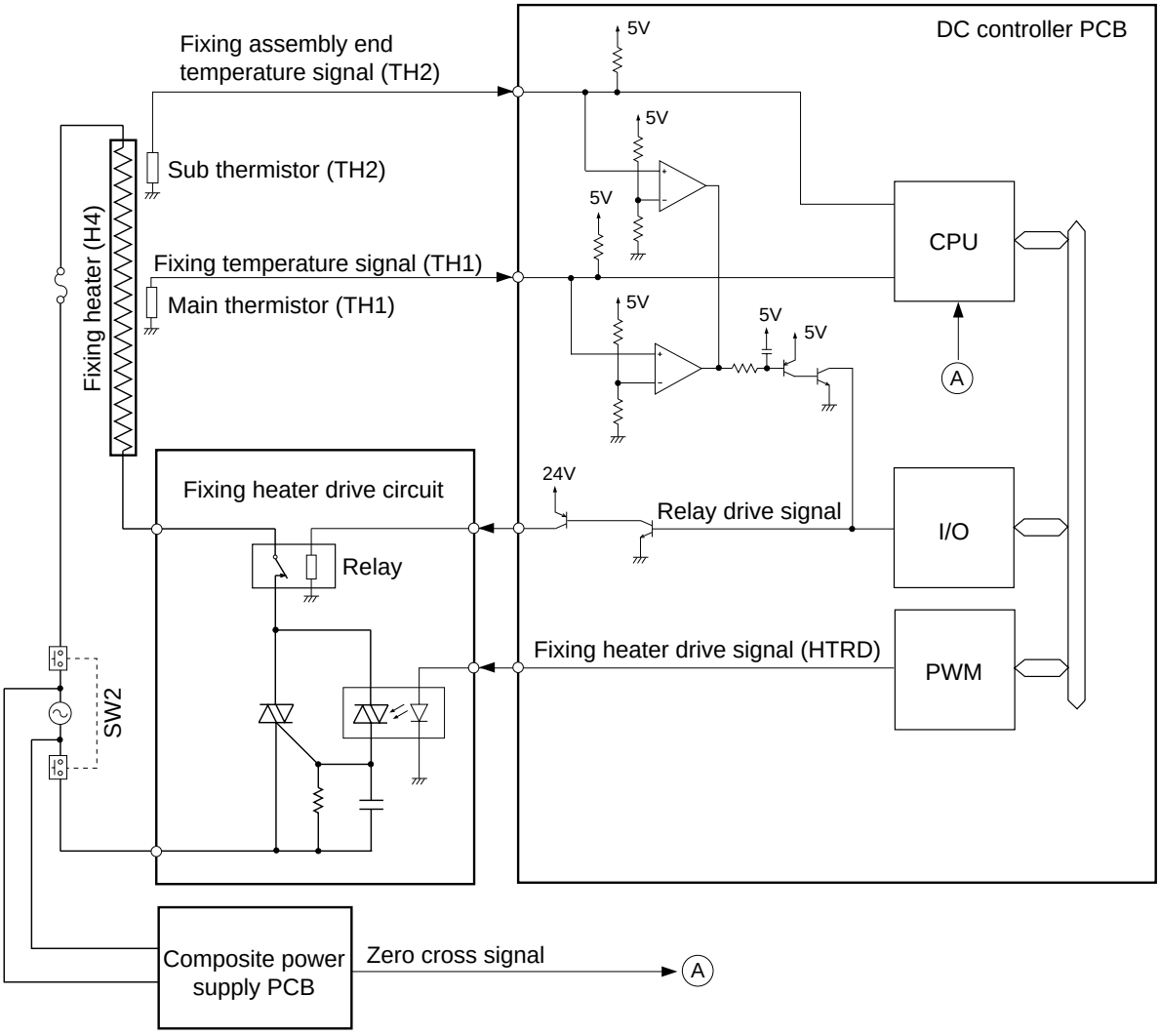

Figure 3-639

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2. Controlling the Temperature of the Fixing Heater

The fixing heater is turned OFF during standby. To prevent fixing faults caused by low temperature, either of the following five types of temperature control is executed depending on the temperature of the fixing heater (output of the main thermistor TH1) at power-on and the count of copies to be made.

a. If the temperature at copy start is less than 100°C, either of further five types of control is chosen depending on the count of copies: ① 235° to 190°C, ② 225° to 180°C, ③ 215° to 180°C, ④ 250° to 180°, and ⑤ 195° to 180°C. Normally, one of ② through ④ is sleeted.

■ Control ①

1st to 4th copy → 235°C
5th to 6th copy → 230°C
7th to 20th copy → 225°C
21st to 30th copy → 215°C
31st to 40th copy → 210°C
41st to 50th copy → 200°C
51st to 100th copy → 190°C

■ Control ②

1st to 4th copy → 225°C
5th to 6th copy → 220°C
7th to 20th copy → 215°C
31st to 40th copy → 210°C
41st to 50th copy → 190°C
51st to 100th copy → 180°C

■ Control ③

1st to 20th copy → 215°C
21st to 30th copy → 210°C
31st to 40th copy → 200°C
41st to 50th copy → 190°C
51st to 100th copy → 180°C

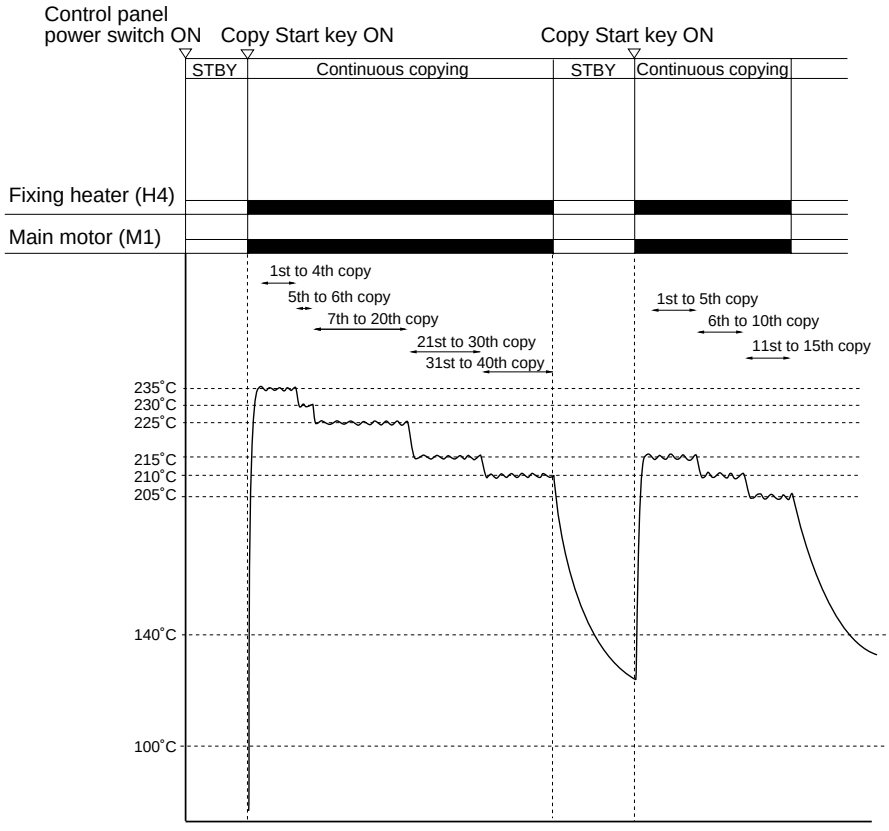

Figure 3-640

■ Control ④
1st to 30th copy → 205°C
31st to 40th copy → 200°C
41st to 50th copy → 190°C
51st to 100th copy → 180°C
■ Control ⑤
1st to 40th copy → 195°C
41st to 50th copy → 190°C
51st to 100th copy → 180°C

b. If the temperature is 100°C or more or less than 140°C at copy start, one of further three types of control is chosen depending on the count of copies: ❶ 215° through 180°C, ❷ 205° through 180°C, and ❸ 195° through 180°C:
■ Control ❶
1st to 5h copy → 215°C
6th to 10th copy → 210°C
11th to 15th copy → 205°C
16th to 20th copy → 200°C
21st to 30th copy → 195°C
31st to 40th copy → 190°C
41st to 50th copy → 185°C
51st to 100th copy → 180°C
■ Control ❷
1st to 15th copy → 205°C
16th to 20th copy → 200°C
21st to 30th copy → 195°C
31st to 40th copy → 190°C
41st to 50th copy → 185°C
51st to 100th copy → 180°C
■ Control ❸
1st to 30th copy → 195°C
31st to 40th copy → 190°C
41st to 50th copy → 185°C
51st to 100th copy → 180°C

c. If the temperature is 140°C or more at copy start, control is exerted so that the temperature will be 180°C at all times.
1st to 100th → 180°C

Note that, a (less than 100°C at copy start) and c (100°C or more and less than 140°C) are always combined as follows; the notation “value on label” here refers to the label attached to the fixing assembly, and the settings recorded on the label may be entered in ‘FILM LAMK’ in service mode (*3*) to select a specific fixing control temperature.

Value on label	a	b
0	①	❶
1	②	❶
2	③	❷
3	④	❸
4	⑤	❸

Reference:
Normally, 1, 2, or 3 is selected. Select a higher temperature (lower value) in service mode if fixing faults occur; select a lower temperature (higher value) if offset occurs.
For instance, if fixing faults occur with 2 selected, change it to 1 or 0. Try 1 first and then try 0 if necessary.
If offset occurs with 2 selected, change it to 3; if offset continues, change it to 4.

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3. Controlling the Supply Power to the Fixing Heater

The temperature of the fixing heater is controlled by controlling the power supplied to the fixing heater.

The plane-shaped heater used for the fixing heater tends to be subject to variation because of production factors.

In view of this, you must enter the resistance in service mode (*3*) whenever you have replaced the fixing assembly so that the microprocessor on the DC controller PCB executes appropriate power control.

Caution

The fixing heater resistance is entered in service mode at the factory; do not change it unless you have replaced the fixing assembly.

The power to the fixing heater is controlled by means of phase power control.

The microprocessor controls the output timing of the fixing heater drive signal (HTRD) so that power appropriate to the target temperature of the fixing heater may be supplied (through phase control).

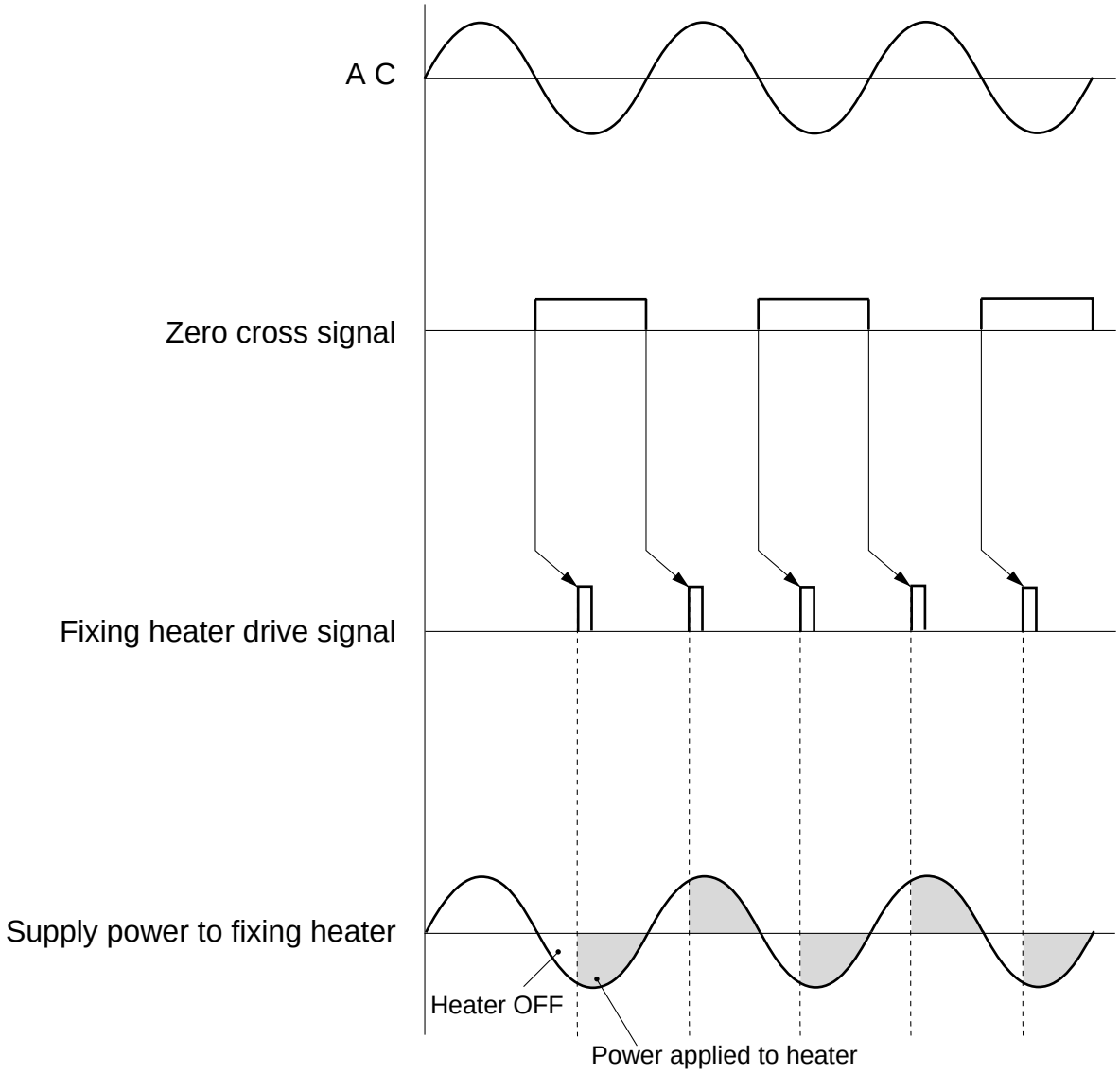

Figure 3-641

4. Detecting Overheating on the Fixing Heater End

The rear end of the fixing heater is equipped with a sub thermistor (TH2) to check for overheating.

This is to prevent overheating and consequent damage to the fixing film which could occur when continuous copying is performed using copy of B4 or smaller in size. (Overheating tends to occur where the drum is not in contact with paper.)

When the output of THE2 exceeds 250°C, the machine increases the sheet-to-sheet distance to accelerate heat discharge of the fixing heater, thereby preventing overheating.

Copying operation is continued with the increased sheet-to-sheet distance even after the output of TH2 falls below 250°C.

If overheating continues after increasing the sheet-to-sheet distance and the temperature exceeds 260°C, the on-going copying operation will be stopped and the power will be turned OFF. (E001 will be registered.)

5. Protection Mechanisms

The machine is equipped with the following protection mechanisms to prevent malfunction of the fixing heater:

a. Thermistor (TH1, tH2)

1. The microprocessor on the DC controller monitors the voltage of the thermistor (TH1, TH2); if it detects overheating of the heater or error low temperature, it stops the power to the heater and turns off the power. (E000 through E003 will be registered.)
2. If the error temperature detection circuit finds that the output of TH1 is 250°C or more or that of TH2 is 260°C for 0.2 sec or more, the heater error detection signal (HTNG) will be issued to turn off the relay, stopping the power to the fixing hater and turning off the power.

b. Thermal Fuse (FU1)

When the temperature around the thermal fuse reaches 226 °C and the condition remains for a specific period of time, the thermal fuse will melt to stop the power to the fixing heater.

c. Heater ON Detection Circuit (200V model only)

The period of time during which the fixing heater drive signal (HTRD) remains OFF is monitored; if an error is detected, the power is turned OFF. (E004 will be registered.)

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6. Correcting the Displacement of the Fixing Film

a. Outline

As rotation continues, the fixing film tends to become displaced to the front or the rear. To correct such displacement, the machine has a fixing film displacement correction mechanism.

The correction is by the fixing film sensor (PS2) for detecting the position of the fixing film motor (M5) for correcting the position of the film.

Caution:

The lower roller is released when the front door is open. If the power is turned on in this condition, the fixing film can become displaced or the fixing heater can become damaged.
Be sure to keep the roller locked when working with the front door open.

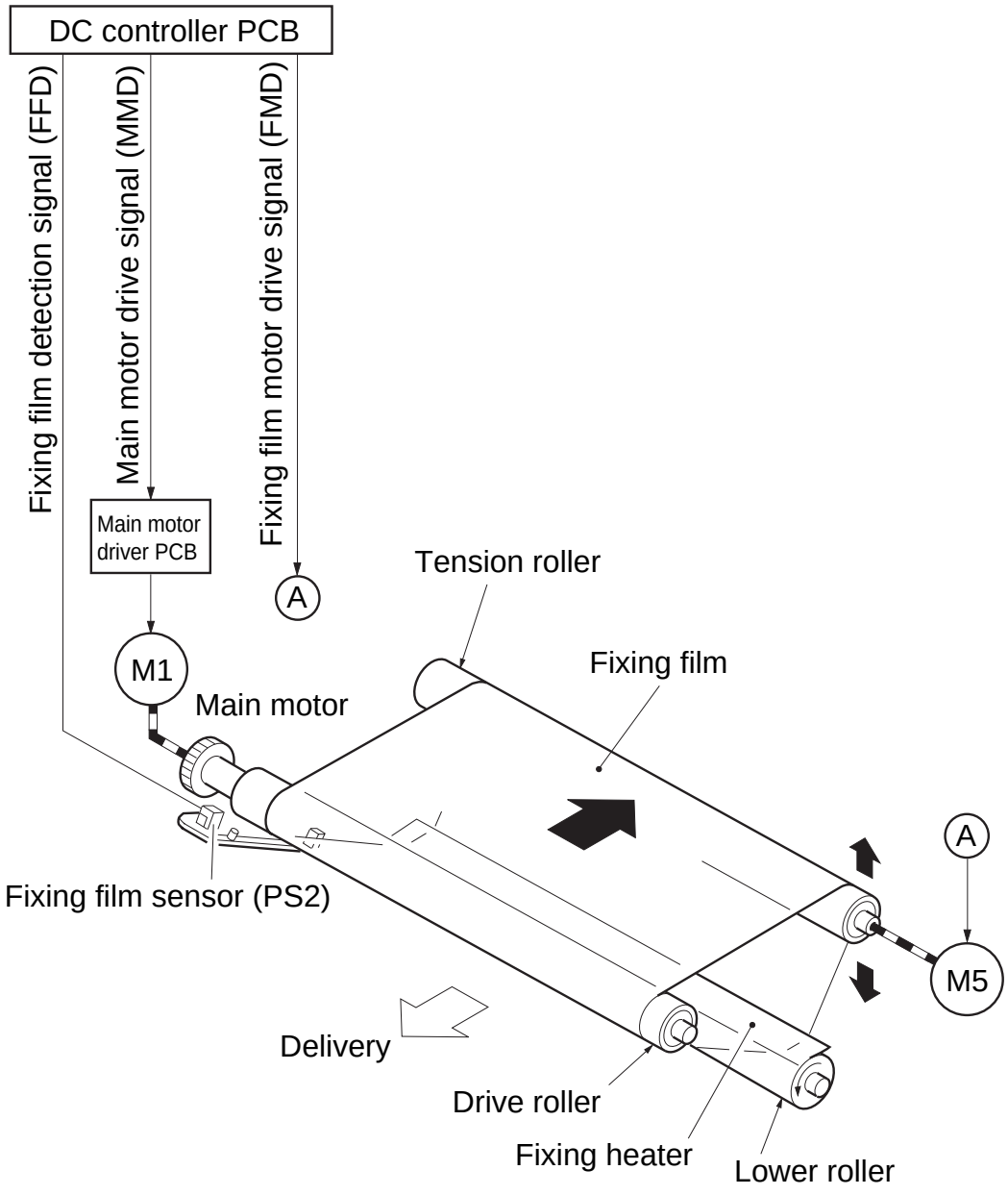

Figure 3-642

The fixing film sensor (PS2) is located at the edge of the film to detect the position of the fixing film.

The rear (sensor side) of the fixing film has a notch as shown in Figure 3-643 so that the fixing film sensor repeats turning ON and OFF.

Normally, the sensor remains ON and OFF for the same period of time when the fixing film is centered.

When the fixing film starts to move to the rear, the sensor will tend to remain ON longer than OFF; if the film starts to move to the front, the sensor will tend to remain OFF longer than OFF. (See Figure 3-644.)

The DC controller checks the ratio between ON and OFF periods of the sensor to correct the position of the fixing film.

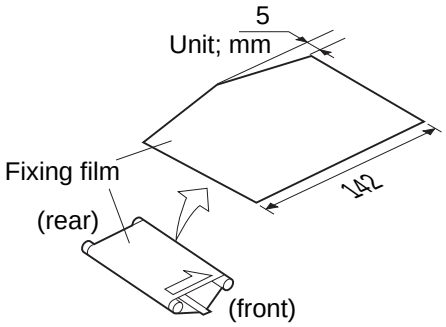

Figure 3-643

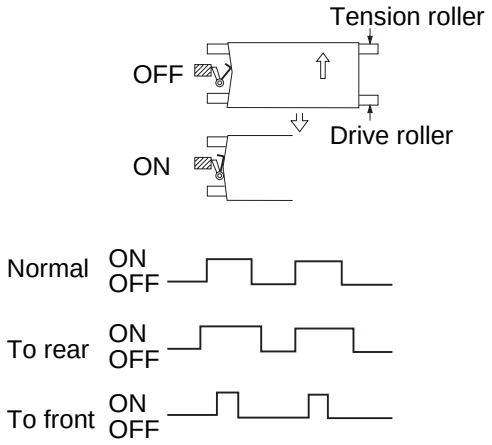

Figure 3-644

The fixing film motor (M5) is used to correct the position of the fixing film.

When displacement of the fixing film is detected, the DC controller rotates the fixing film motor to move the rear of the tension roller up and down, thereby moving the fixing film to the center and correcting the displacement.

If the fixing film has become replaced to the rear, the tension roller is moved down to return the fixing film to the front.

If the fixing film has become displaced to the front, the tension roller is moved up to return the fixing film to the rear.

These operations are executed as necessary to control the position of the fixing film.

If the film has become displaced so much that the correction mechanism cannot control it, 'E007' will be indicated. (See the Service Handbook.)

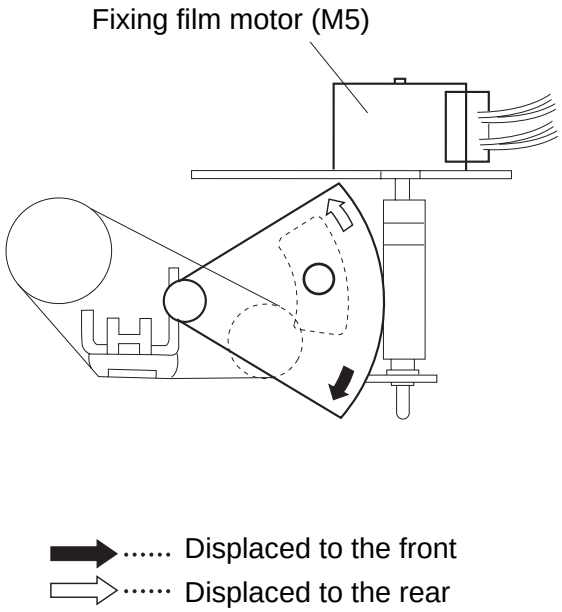

Figure 3-645

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b. Controlling the Fixing Film Motor

The fixing film motor is a stepping motor rotated by pulse signals A, A*, B, B*.

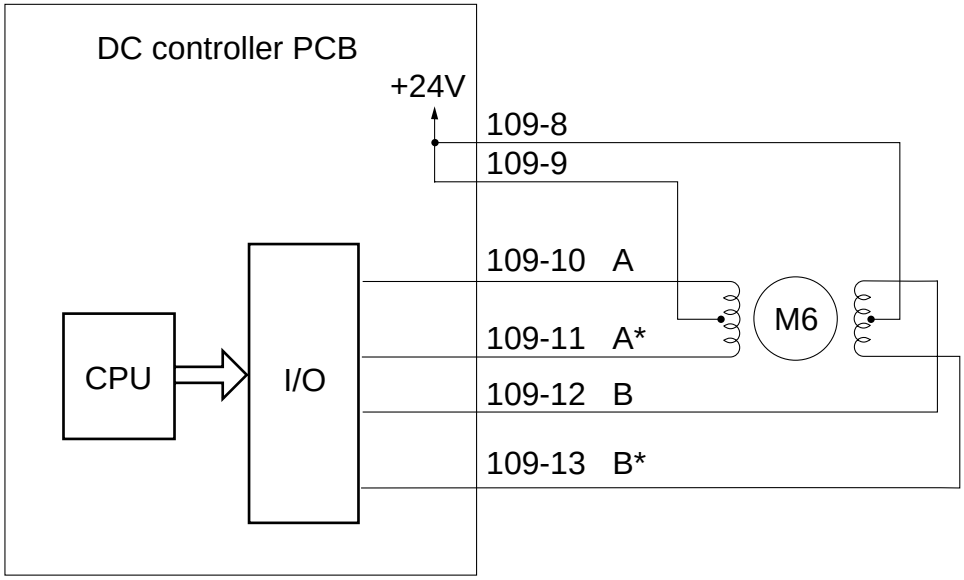

Figure 3-646

7. Locking the Fixing Assembly

The locking between the film and the lower roller of the fixing assembly is designed to be released when the front door is opened.

Operating the machine with the front door open for servicing work and, therefore, with the fixing unlocked can displace the film. For this reason, you must always lock the fixing assembly as follows if you need to operate the machine with its front door open.

Use the separation cleaning static eliminator cleaning brush attached behind the front door for locking.

Using the Separation Static Eliminator

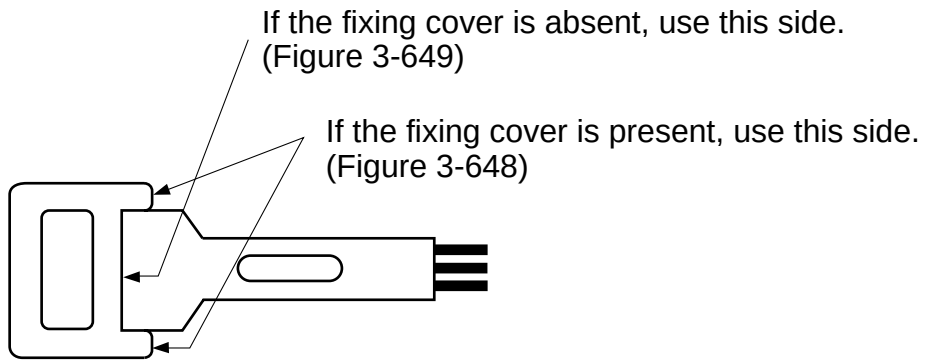

Figure 3-647

① If the fixing assembly cover is found,
Insert the handle of the separation static eliminator cleaning brush as shown, and turn it 90° to fix in place, thereby locking the fixing assembly.

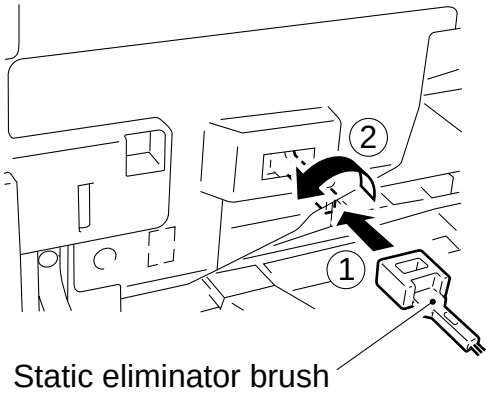

Figure 3-648

② If the fixing cover is not found,
Hold the cam stop arm so that it is parallel with the front plate of the machine. Insert the handle of the separation static eliminator cleaning brush as shown into the gap on the right of the cam stop arm, thereby locking the fixing assembly.

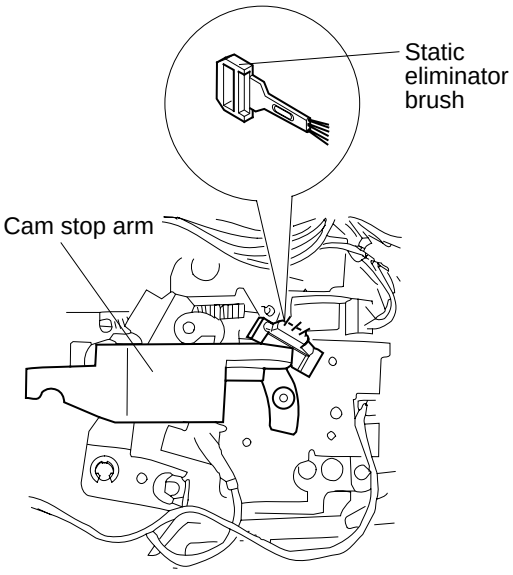

Figure 3-649

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L. Delivery Assembly

1. Outline

The machine allows the selection of either of two delivery modes in user mode/service mode.

a. Face-Up Delivery

In this mode, copies are delivered with the copied sides up (e.g., when delivering one-sided copies or delivering two-sided copies after copying on the second side).

Initially, face-up delivery mode is selected regardless of the selected copying mode.

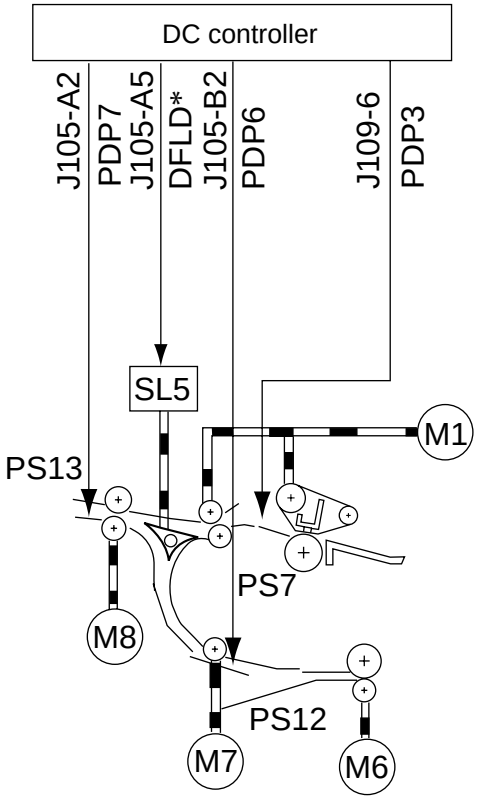

Figure 3-650

b. Face-Down Delivery

In this mode, copies are delivered with the copied sides down (e.g., when delivering one-sided copies or delivering two-sided copies after copying on the second side).

When copy paper has been moved through the fixing assembly, the paper deflecting plate 1 operates to move it in the direction of the lower feeding assembly (face down delivery unit).

A specific period of time after the leading edge of copy paper has moved past the lower feeding assembly inlet paper sensor (PS12), the lower feeding assembly inlet roller starts to rotate in reverse for face-down delivery. See Figure 3-650 and Table 3-613 for the electrical parts involved in face-down delivery.

M1	Main motor
M6	Set-back roller motor
M7	Lower feeding assembly inlet roller motor
M8	Delivery roller motor
SL5	Paper deflecting plate 1 solenoid
PS7	Fixing rear paper sensor
PS12	Lower feeding assembly inlet paper sensor
PS13	Delivery sensor

Table 3-613 Electrical Parts

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1) When the leading edge of the last copy reaches the fixing paper sensor (PS7), the paper deflecting plate 1 solenoid (SL5) turns ON to move the copy paper to the lower feeding assembly.

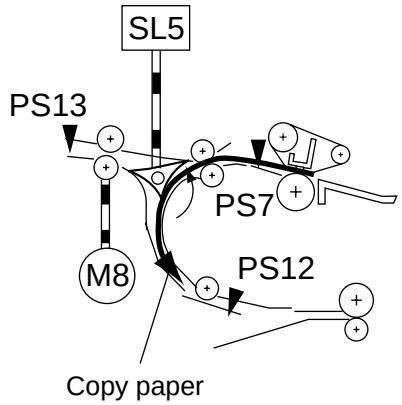

Figure 3-651 Paper Deflecting Plate 1 Solenoid ON

2) When the leading edge of the last copy reaches the lower feeding assembly inlet paper sensor (PS12) and a specific period of time passes, the lower feeding assembly inlet motor (M7) starts to rotate in reverse. A specific period of time thereafter, the delivery motor (M8) turns ON for face-down delivery. (A specific period of time after the delivery roller motor (M8) has turned ON, the paper deflecting plate (SL5) turns OFF.)

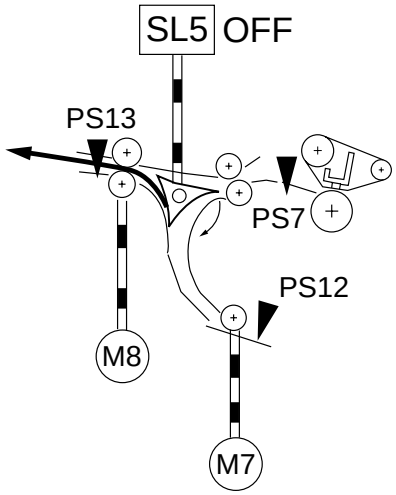

Figure 3-652 Paper Deflecting Plate 1 Solenoid OFF

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2. Sequence of Operations

See Figure 3-653 for the sequence of operations for face-down delivery.

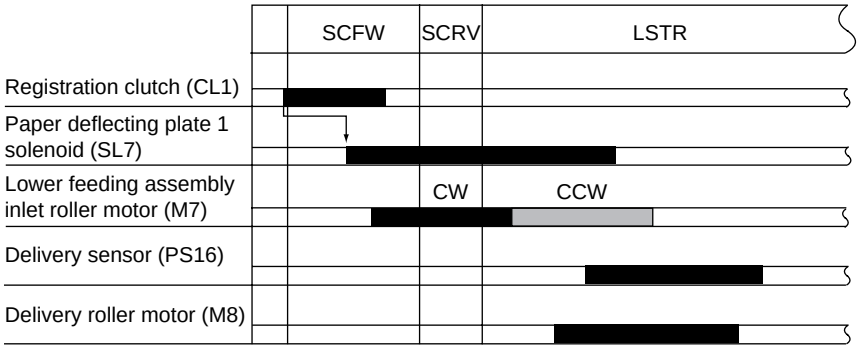
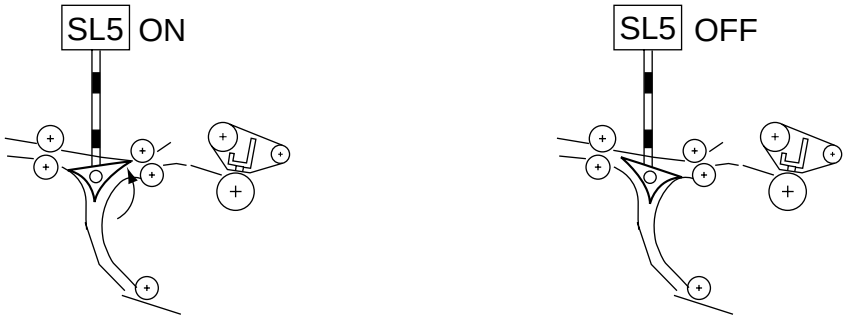


Figure 3-653 Face-Down Delivery

Reference:

Normally, the paper deflecting plate 1 solenoid (SL5) remains OFF. It turns ON only when feeding copy paper from the fixing assembly to the lower feeding assembly.



Feeding copy paper from the fixing assembly to the lower feeding assembly

Figure 3-654 Movement of the Paper Deflecting Plate 1

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M. Detecting Jams

1. Outline

As many as seven paper sensors (Figure 3-655) are used to check whether copy paper is moving properly or to check for jams.

The microprocessor on the DC controller PCB runs checks at such times as programmed in advance in reference to the presence/absence of paper at specific sensors. When it detects a jam, it will turn OFF the main motor and indicate the Jam message on the control panel.

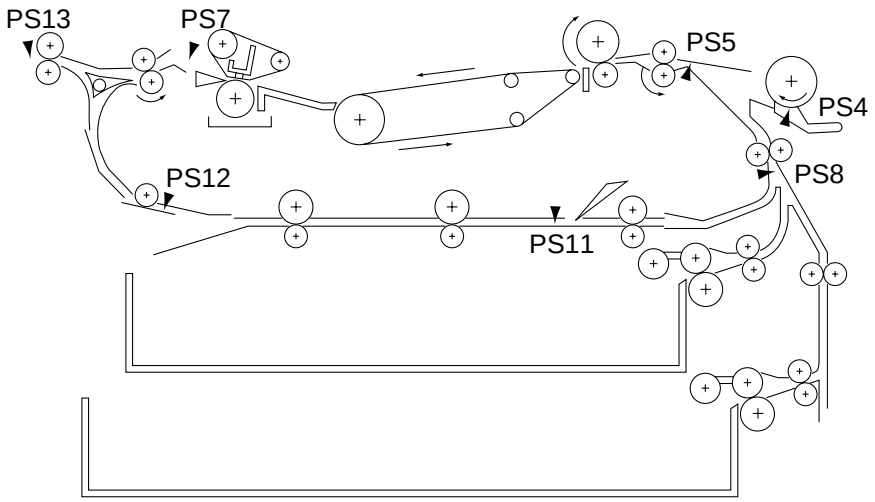

Figure 3-655

	Sensor	Signal	Jack*
PS4	Multifeeder paper sensor	MFPD*	J113-A11
PS5	Pre-registration paper sensor	PDP 1	113-A5
PS7	Fixing rear paper sensor	PDP 3	J109-6
PS8	Vertical path paper sensor	PDP 4	J113-A2
PS11	Re-pick up front paper sensor	PDP 5*	J103-2
PS12	Lower feeding assembly inlet sensor	PDP 6*	J105-B2
PS13	Delivery assembly paper sensor	PDP 7*	J105-A2

*Jack in the signal line on the DC controller PCB.

Table 3-614

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2. Types

The microprocessor identifies jams in the following conditions:

a. Delay Jam

Copy paper does not reach the appropriate sensor within a specific period of time, i.e., the sensor does not turn ON.

b. Stationary Jams

Copy paper does not move past the appropriate sensor within a specific period of time after the sensor detected the paper, i.e., the sensor does not turn OFF.

c. Residual Jam

Paper remains over a sensor at power ON, i.e., the sensor detects paper.

Note:

A jam will be identified if the front door, right, door, or delivery door is opened during copying or when the cassette is slid out.

3. Sequence of Operations

a. Pick-Up Delay Jam

A delay jam will be identified if copy paper does not reach the vertical path paper sensor (PS8) within a specific period of time after the vertical path clutch (CL3) has turned ON.

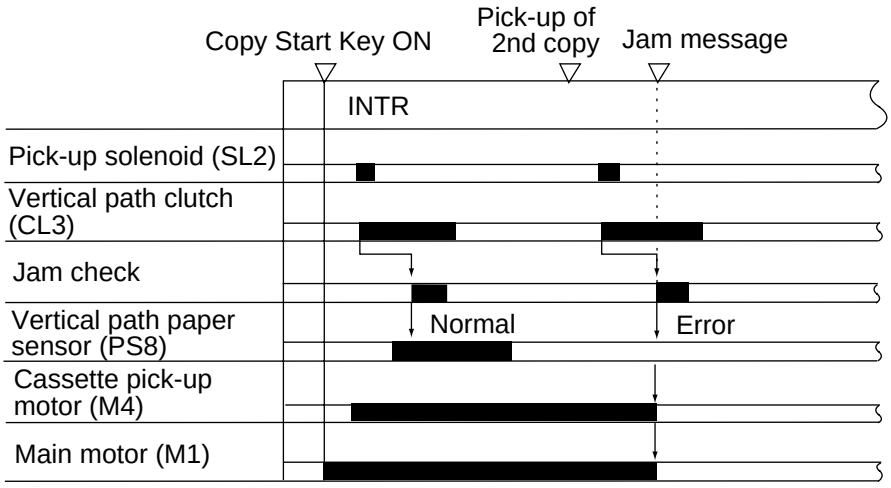

Figure 3-656 Sequence for Pick-Up Delay Jams

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b. Multiple Pick-Up Pre-Registration Sensor Delay Jam

A delay jam will be detected if copy paper does not reach the pre-registration sensor (PS5) within a specific period of time after the multiple pick-up clutch (CL2) has turned ON.

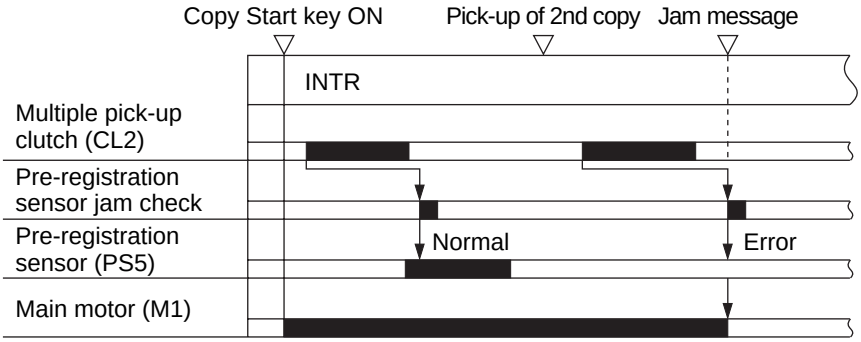

Figure 3-657

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c. Pre-Registration Sensor Delay Jam

A delay jams will be identified if copy paper does not reach the pre-registration paper sensor (PS5) within a specific period of time after the vertical path roller clutch (CL3) has turned ON.

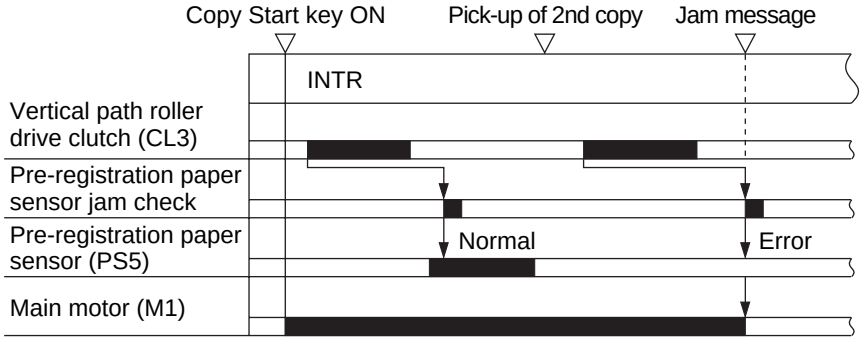

Figure 3-658 Sequence for Pre-Registration Roller Paper Sensor Jams

d. Separation Paper Sensor Delay Jam

A delay jam will be identified if copy paper does not reach the separation paper sensor (PS6) within a specific period of time after the registration roller clutch (CL1) has turned ON.

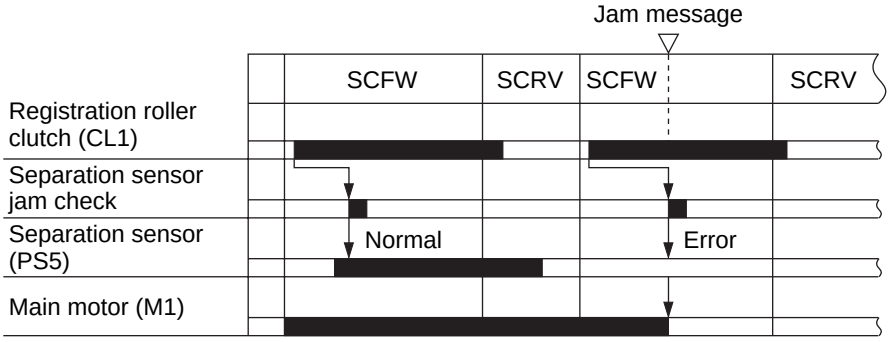

Figure 3-659 Sequence for Separation Sensor Delay Jams

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e. Fixing Assembly Paper Sensor Delay Jam

A delay jam will be identified if copy paper does not reach the fixing rear paper sensor (PS7) within a specific period of time after it has moved past the registration clutch (CL1).

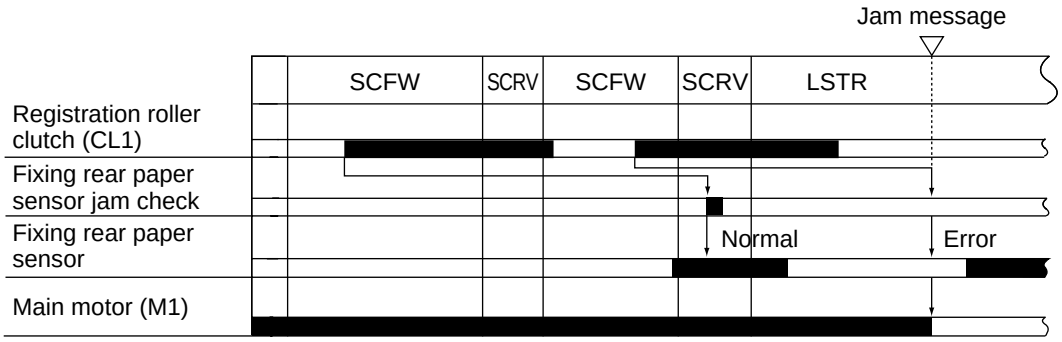

Figure 3-660 Sequence for Fixing Assembly Paper Sensor Delay Jams

f. Delivery Sensor Delay Jam

A delay jam will be identified if copy paper does not reach the delivery sensor (PS13) within a specific period of time after it has moved past the fixing rear paper sensor (PS7).

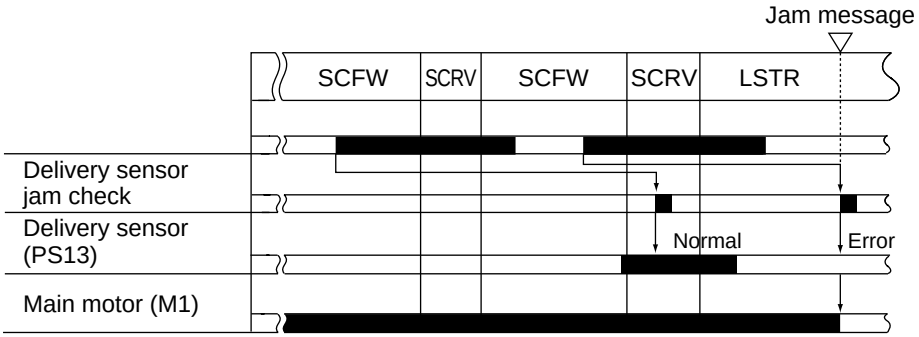

Figure 3-661 Sequence for Delivery Delay Jams

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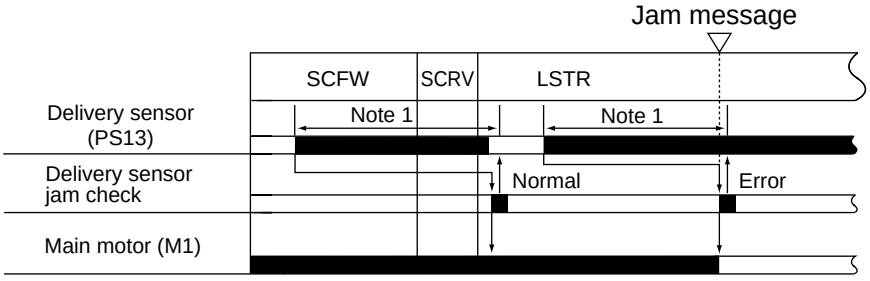
g. Delivery Sensor Stationary Jams

A stationary jam will be identified if copy paper does not move through the delivery sensor within a specific period of time after the delivery paper sensor (PS13) has turned ON.



Note 1 : The distance varies according to the length of copy paper.

Figure 3-662 Sequence for Delivery Sensor Stationary Jams

Note:
The distance varies according to the length of copy paper.

h. Lower Feeding Assembly Inlet Sensor Delay Jam (overlay copying)

A delay jam will be identified if copy paper does not reach the lower feeding assembly inlet sensor (PS12) within a specific period of time after it has moved past the fixing rear paper sensor (PS7).

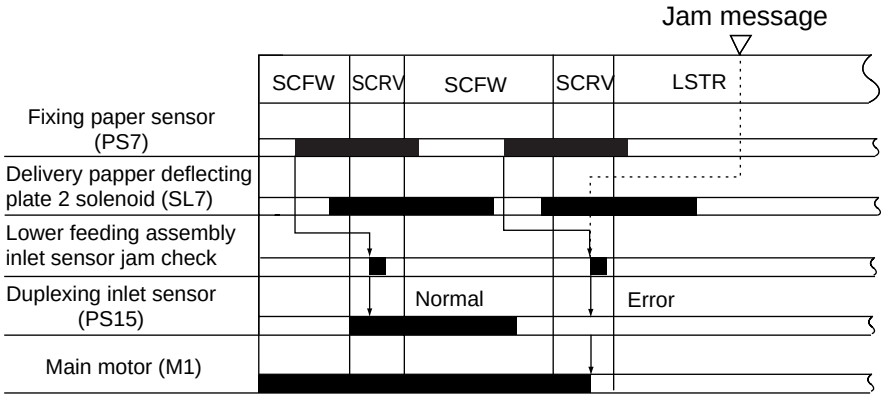


Figure 3-663 Sequence for Lower Feeding Assembly Inlet Delay Jams (overlay copying)

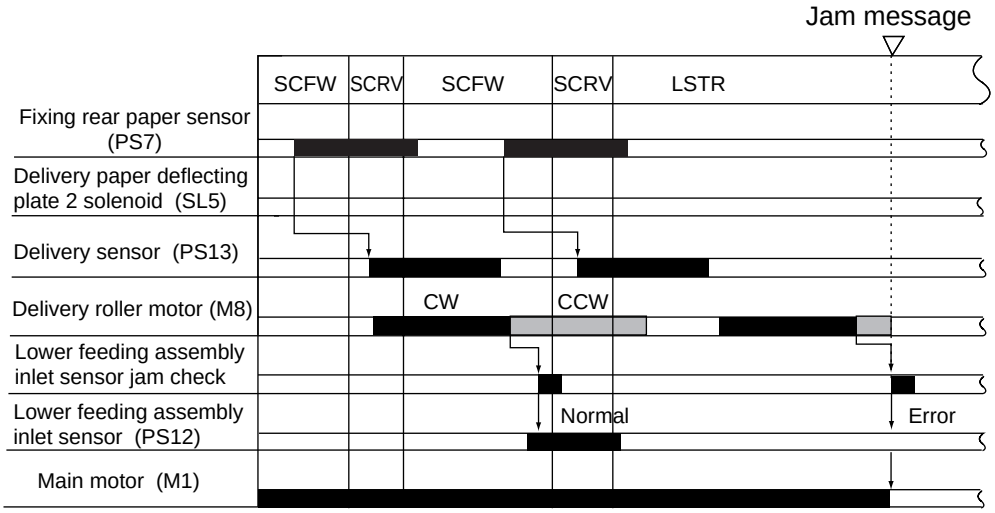


Figure 3-664 Sequence for Lower Feeding Assembly Inlet Delay Jams (two-sided copying)

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i. Duplexing Assembly Re-Pick Up Sensor Delay Jam

A delay jam will be identified if copy paper does not reach the re-pick up sensor (PS11) within a specific period of time after it has moved past the lower feeding assembly inlet sensor (PS12).

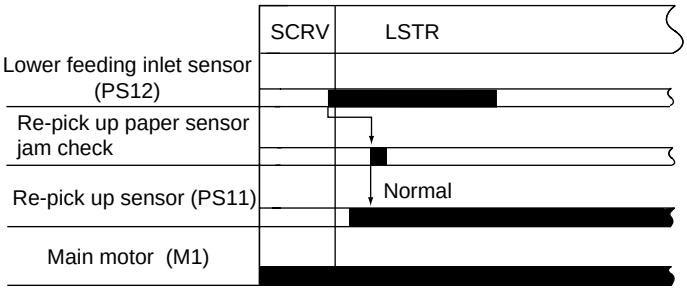

Figure 3-665 Sequence for Re-Pick Up Delay Jams (normal)

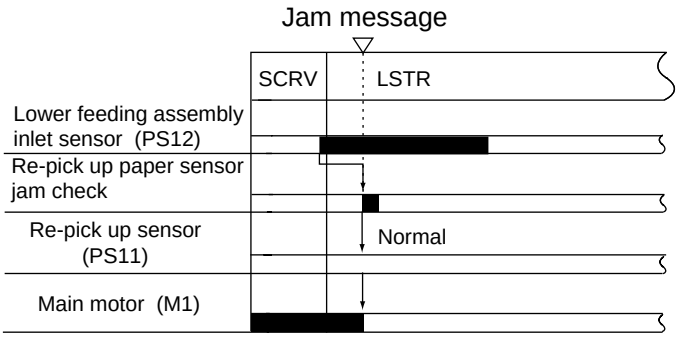

Figure 3-666 Sequence for Re-Pick Up Delay Jams (error)

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4. Jam History

The machine retains a history of jams which have occurred inside the machine. You may check the history in service mode.

In memory are

- The remaining number of copies and
- The effective copying mode.

Using the memory, the copier will operate using the effective copying mode and make the remaining number of copies once the jam has been removed.

Reference:

If the message “Return Original and Press Start” appears on the control panel after removing the jam, put the original back into the feeder as they were set initially.

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VII. FANS

A. Functions and Operations

1. Outline

As many as five fans are used in the machine for such functions as are shown in Table 3-701. Figure 3-701 shows the arrangement of the fan, and Figure 3-702 shows the timing of operation.

No.	Name	Orientation	Function
FM1	Feeding fan	Drawing	Keeps copy paper on the feeding belt.
FM2	Exhaust fan	Drawing	Exhausts heat.
FM3			
FM4	Laser cooling fan	Drawing	Cools the laser elements.
FM5	Electrical unit fan	Drawing	Exhausts heat from the electrical unit.
FM6	Lower feeding assembly cooling fan	Blowing	Cooling copy paper in the lower feeding unit

Table 3-701

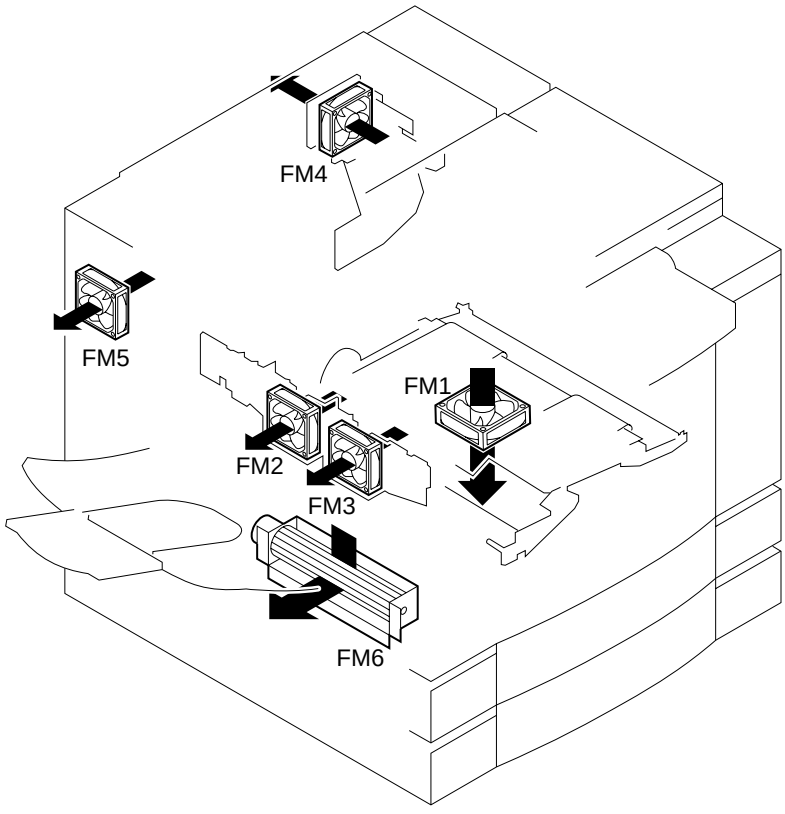

Figure 3-701

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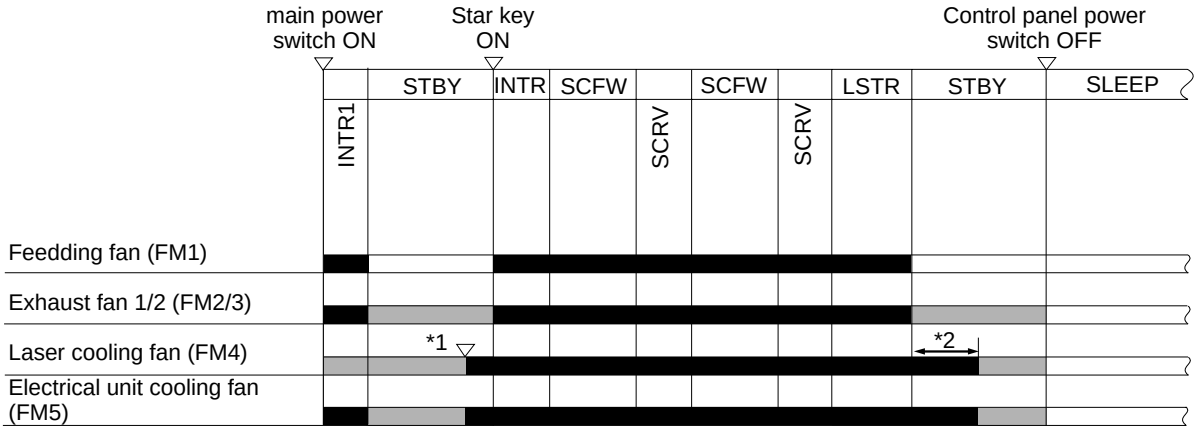
2. Sequence of Fan Operations



High-speed rotation
Low-speed rotation

1: Quite mode is set to either 1 through 9 min; the operation occurs when
* A key is pressed,
* An original is placed in the feeder, or
* The copyboard cover or the feeder is opened.
2: Varies depending on the setting for quiet mode.

Figure 3-702

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VIII. POWER SUPPLY

A. Outline

The machine's DC power is generated by the composite power supply PCB. The composite power supply PCB serves as the DC power supply and also as a lamp unit and a high-voltage transformer unit.

Figure 3-801 is a block diagram of the entire composite power supply PCB, and Figure 3-801 gives an outline of the DC power supply.

■ Composite Power Supply Output

Output voltage	Output voltage
24VR	24V±5%
24VU	24V±10%
+7V	8.75V±26%
+15V	15V±5%
–12V	–12V±5%
5.1V	5.1V±3%
+5V	5V±%

Table 3-801

2. Power Supply with the Control Panel Power Supply OFF (SLEEP)

The state in which the control panel power switch if OFF is called SLEEP state, and it may be either power saving mode (SLEEP 2) or quick start mode (SLEEP 1) as selected by the power saving switch.

a. Power Saving Mode (SLEEP 2)

In power saving mode, power is supplied only to the CPU on the composite power supply PCB. (Power to the system power supply circuit needed when the Printer Board or the like is installed will not be cut.)

In power saving mode, FAX reception is enabled. When a communication arrives, the CI signal is generated within the NCU. The CI signal is sent to the CPU on the composite power supply PCB through the FAX Motherboard, thereby turning ON the composite power supply PCB to start supply power to each PCB.

In power saving mode, however, printer functions are not enabled. (For this reason, software is programmed so that a switch to power saving mode is not allowed if the Printer Board is installed or a FAX function is set to start at a specific time.)

b. Quick Start Mode (SLEEP 1)

In quick start mode, the image processor PCB and the DC controller PCB (white areas in Figure 3-802) are supplied with power. In this mode, FAX and printer functions are enabled.

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- Outline of Power Supply in Standby

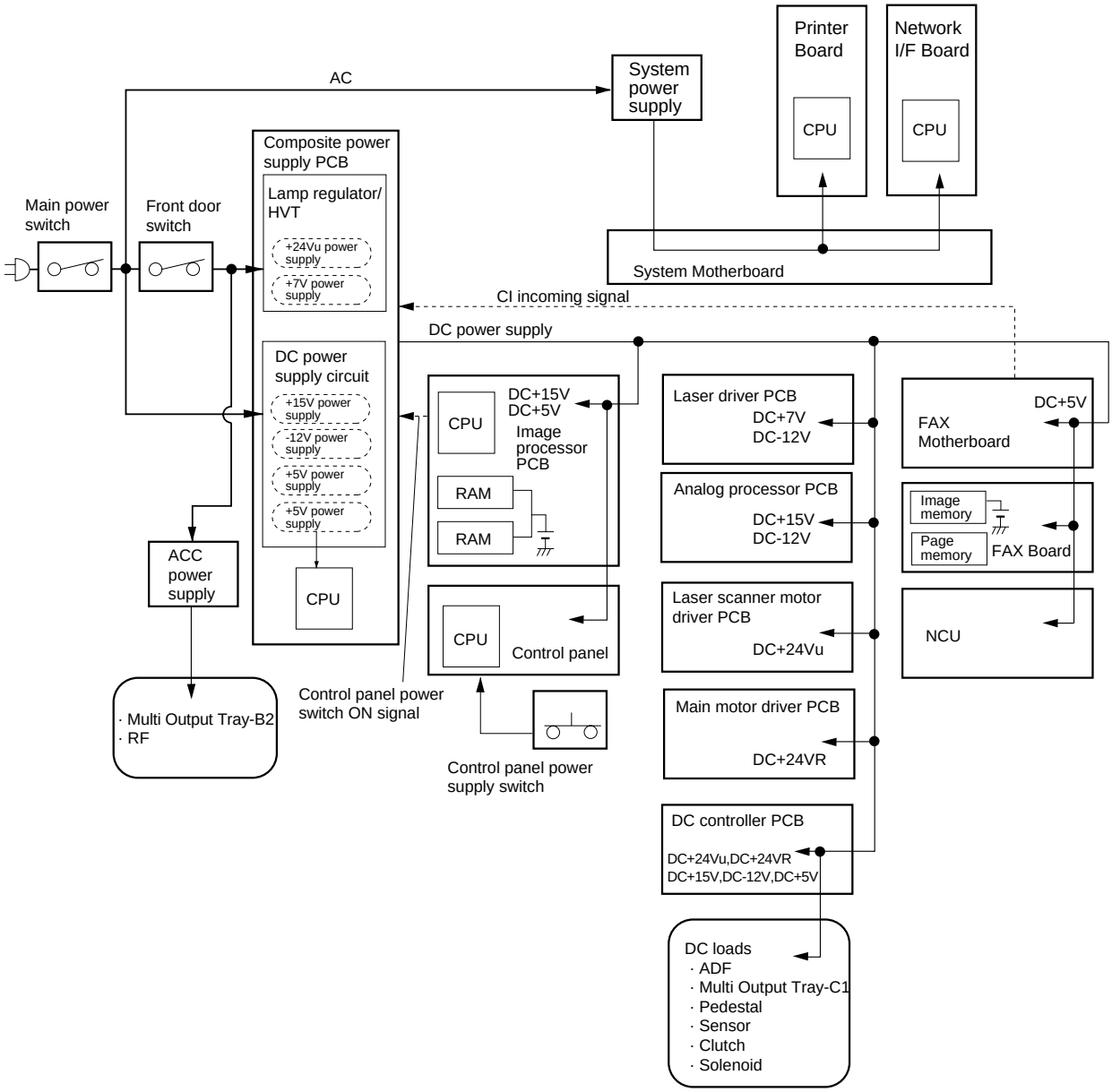

Figure 3-801

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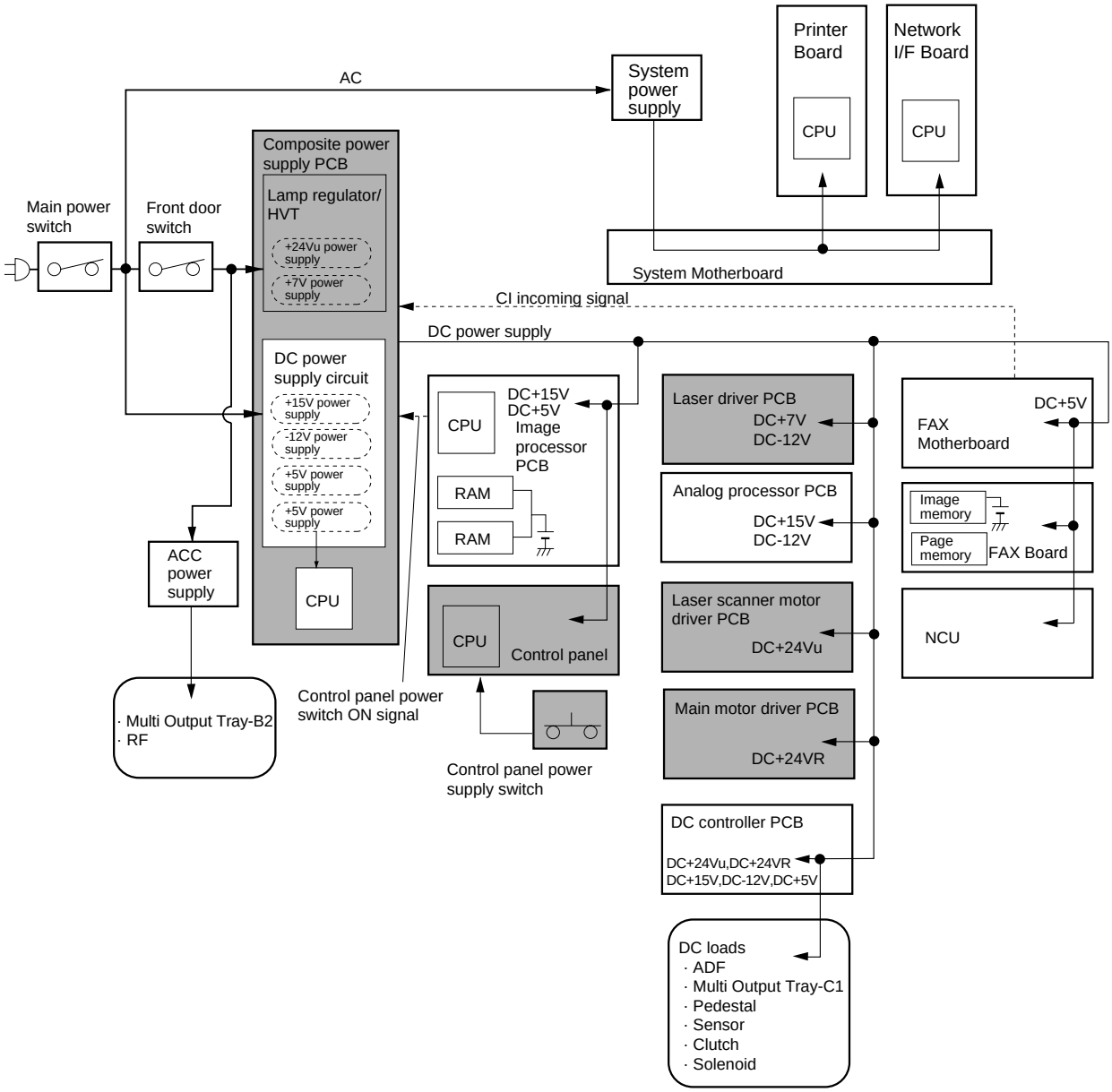
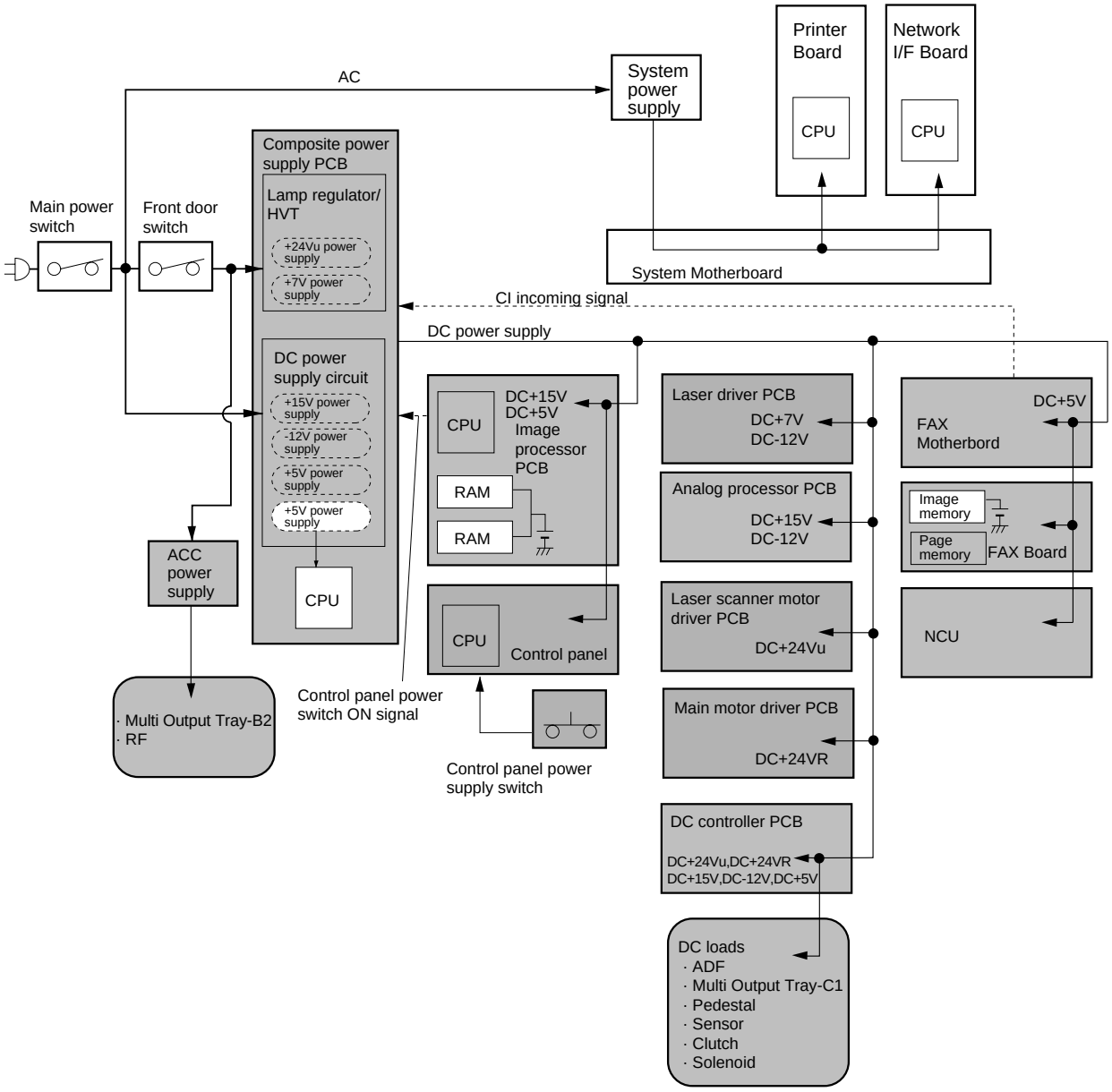
• Outline of Power Supply in SLEEP 1 (quick start mode)



*Power is not supplied to shaded units.

Figure 3-802

- Outline of Power Supply in SLEEP 2 (power saving mode)



*Power is not supplied to shaded units.

Figure 3-803

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B. SLEEP Mode

1. Outline

The machine has the following four states depending on the mode of power supply:

- Power OFF, in which the main power switch is OFF.
- SLEEP 1, in which quick start mode is enabled.
- SLEEP 2, in which power saving mode is enabled.
- Standby, in which the machine is ready for operation.

The machine moves through these states as follows:

① Power OFF to Standby
- When the main power switch is turned ON.

② Standby to SLEEP 1
- When the control panel power switch is turned ON.
- When auto power-off is enabled, or
- When weekly timer is enabled.

③ SLEEP 1 to Standby
- When the control panel power switch is turned ON, or
- During off-hook.

④ SLEEP 1 to SLEEP 2

When all the following conditions exist:
- When there is no transmission reservations.
- When there is no timer operations reservations (e.g., timer polling, timer reporting).
- When there is no reception document.
- When there is no document waiting for printing.
- During on-hook.
- When there is no Printer Board.
- When the power saving switch is at the bottom.

⑤ SLEEP 2 to SLEEP 1
- When an incoming call is detected.

⑥ SLEEP 2 to Standby
- During off-hook.
- When the control panel power switch is turned ON.
- When the power saving switch is turned ON (from bottom to top).

<table>
<tr><th rowspan="2">State</th><th colspan="4">Device</th><th rowspan="2">Description</th></tr>
<tr><th>CPU on composite power supply</th><th>CPU on image processor PCB</th><th>LCD</th><th>FAX image memory</th></tr>
<tr><td>Power OFF</td><td>Stops</td><td rowspan="2">Stops</td><td rowspan="3">Stops</td><td>Retained by battery</td><td>None</td></tr>
<tr><td>SLEEP 2</td><td rowspan="3">Operates</td><td rowspan="4">Retained by power supply</td><td>Fax reception is enabled; after arrival, moves to SLEEP 1.</td></tr>
<tr><td>SLEEP 1</td><td rowspan="2">Operates</td><td>Functions not requiring operations are enabled: e.g., fax transmission, fax reception, printing.</td></tr>
<tr><td>Standby</td><td>Operates</td><td>All functions are available.</td></tr>
</table>

Table 3-802

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2. Cycle of SLEEP Mode States

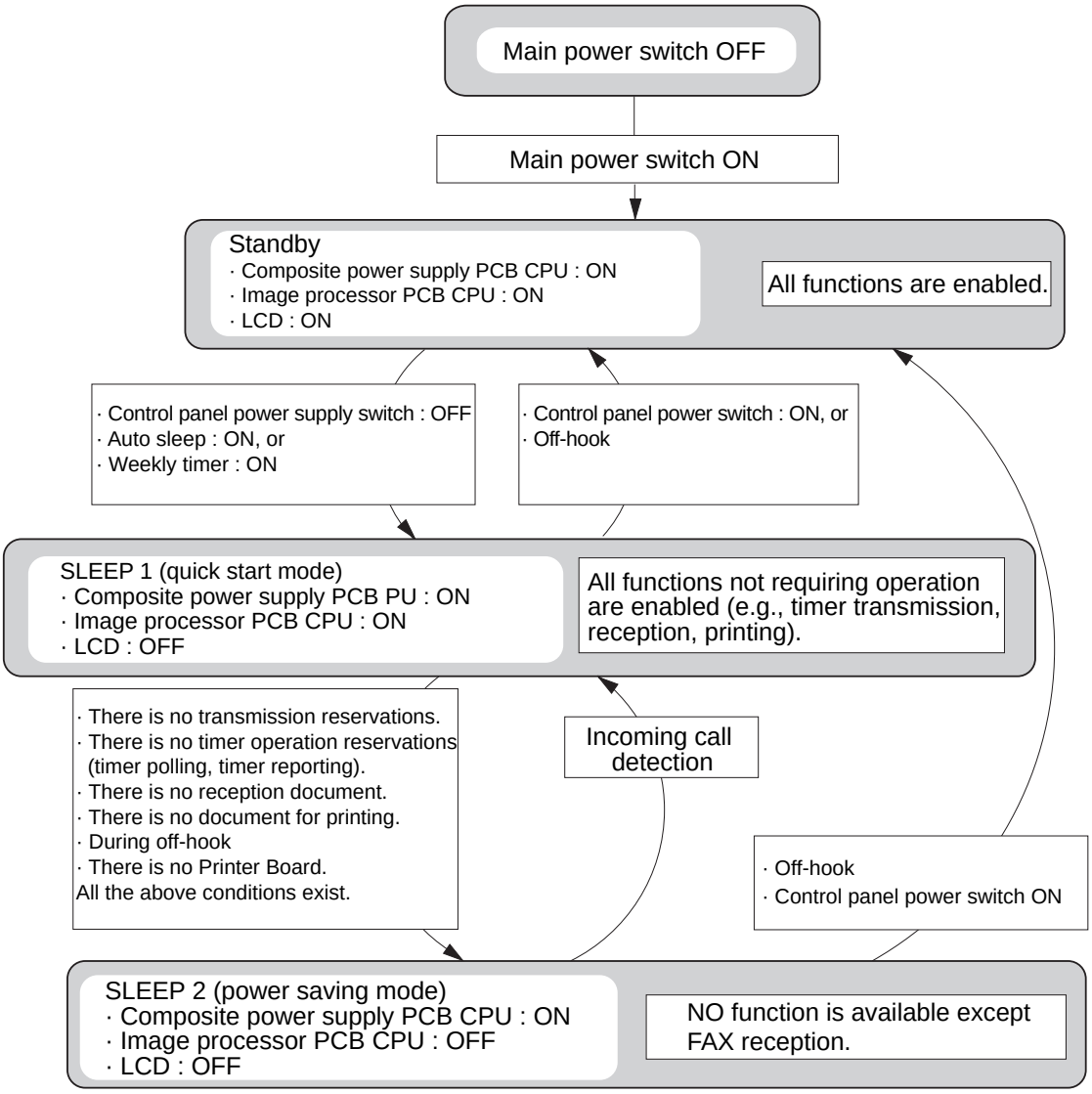
Main power switch OFF
Main power switch ON
Standby
· Composite power supply PCB CPU : ON
· Image processor PCB CPU : ON
· LCD : ON
All functions are enabled.
· Control panel power supply switch : OFF
· Auto sleep : ON, or
· Weekly timer : ON
· Control panel power switch : ON, or
· Off-hook
SLEEP 1 (quick start mode)
· Composite power supply PCB PU : ON
· Image processor PCB CPU : ON
· LCD : OFF
All functions not requiring operation are enabled (e.g., timer transmission, reception, printing).
· There is no transmission reservations.
· There is no timer operation reservations (timer polling, timer reporting).
· There is no reception document.
· There is no document for printing.
· During off-hook
· There is no Printer Board.
All the above conditions exist.
Incoming call detection
· Off-hook
· Control panel power switch ON
SLEEP 2 (power saving mode)
· Composite power supply PCB CPU : ON
· Image processor PCB CPU : OFF
· LCD : OFF
NO function is available except FAX reception.

Figure 3-804

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Reference:

SLEEP 2 (power saving mode)

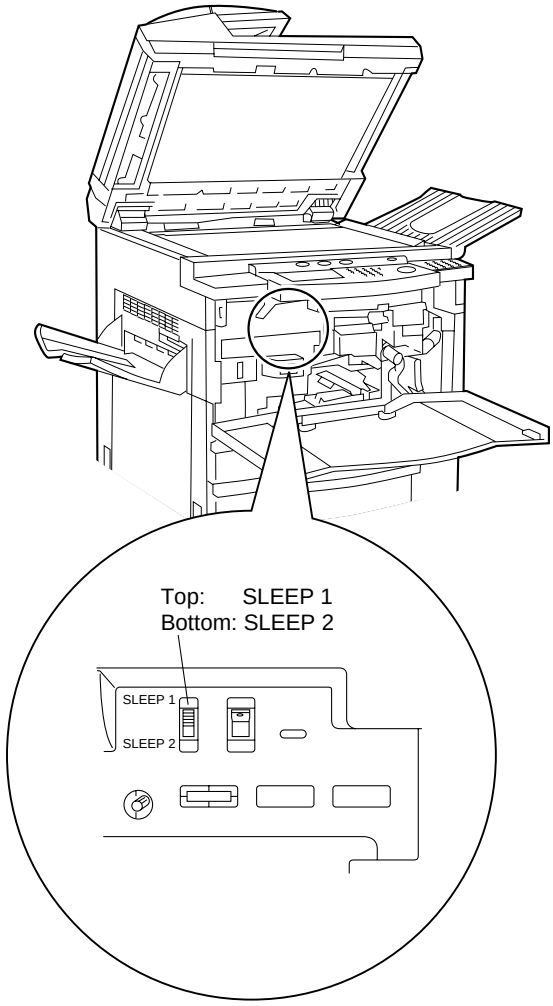
As mentioned, SLEEP 2 (power saving mode) is a state in which only the CPU of the composite power supply PCB is supplied with power, and the machine moves from SLEEP 2 to SLEEP 1 or standby state in response to fax reception, off-hook (including off-hook of extensions), or when the control panel power switch is pressed.

When moving from SLEEP 2, the CPU on the DC controller PCB and the image processor PCB are initialized, and the machine executes initial rotation (INTR1, initial rotation 1).

Since the CPU on the image processor PCB does not recognize the selection of no sound incoming mode, the machine generates a sound once or twice.

If the user wants to suppress the sound or the initial rotation when the machine moves out of SLEEP 2, set the power saving switch to SLEEP 1 (top).

SLEEP 1 provides an anti-condensation function for areas around the scanner system, but SLEEP 2 does not have this function.



IX. SYSTEM

A. Basic Operation

1. Outline

The machine may be configured as part of a system with any of the following devices:

- FAX Board
- Printer Board
- Multi Output Tray C1
- Multi Output Tray-B2
- RDF-G1
- ADF-F1
- SCSI Board
- Network Interface Board
- FAX Motherboard*
- CORE/IP Board*
- Protocol Controller PCB**
- System Motherboard**

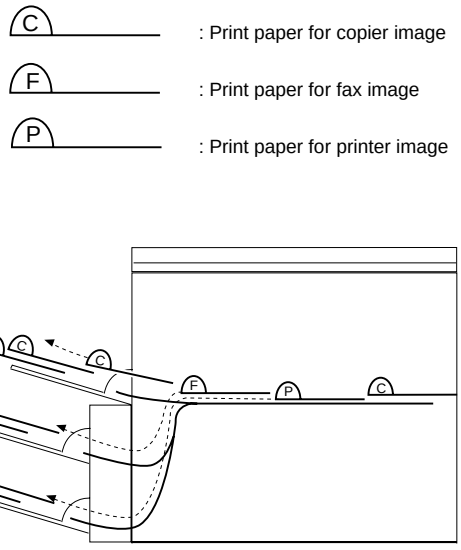
* Included in the Extension Kit A1.
** Included in the Extension Kit B2.

2. Non-Stop Copying

In this mode, specific jobs of the copier, fax, or printer are executed continuously.

Specifically, a copier image, fax image, and printer image may be placed alternately on copy paper while it is being fed continuously, thereby executing three types of jobs without suspending operation.

To take advantage of this mode, the machine must be equipped with the Multi Output Tray12-B2 or the Multi Output Tray C1.



Conceptual Diagram of Non-Stop Copying

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3. Feeder

a. RDF-G1

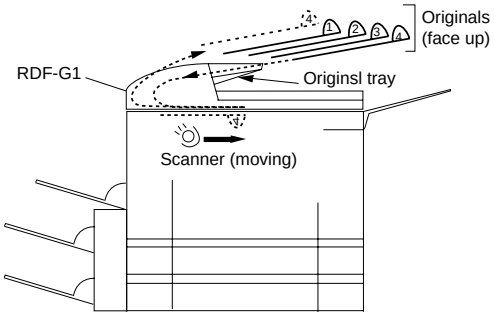
Pick-up for the RDF-G1 occurs differently between copier function and fax transmission.

When making copies, the bottommost original is picked up from a stack and moved to the original tray after copying.

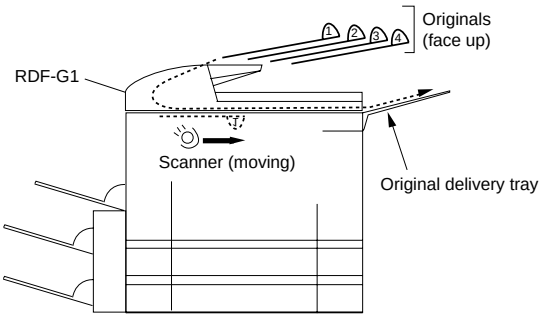
During fax transmission, on the other hand, the topmost original is picked up from the stack and moved to the original delivery tray after reading the image.

You can select copier pick-up for fax transmission under 'FAX_DOC_FEE' in service mode (*5*). However, the order of the pages generated by the fax at the other end will be reversed and the stamping function cannot be used.

• Picking Up Originals for Copying



• Picking Up Originals for Fax Transmission



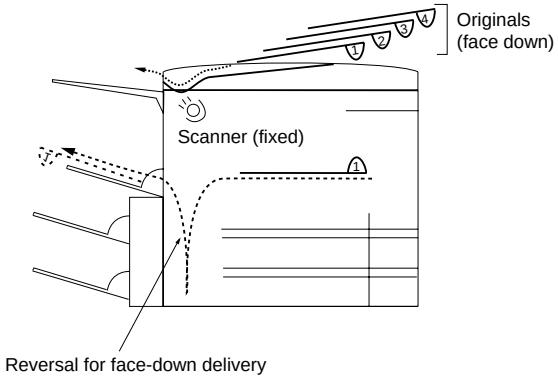
b. ADF-F1

For ADF-F1, an original is read by stopping the scanner at a point about 20 mm from home position, and the original is read while it is being moved (stream reading).

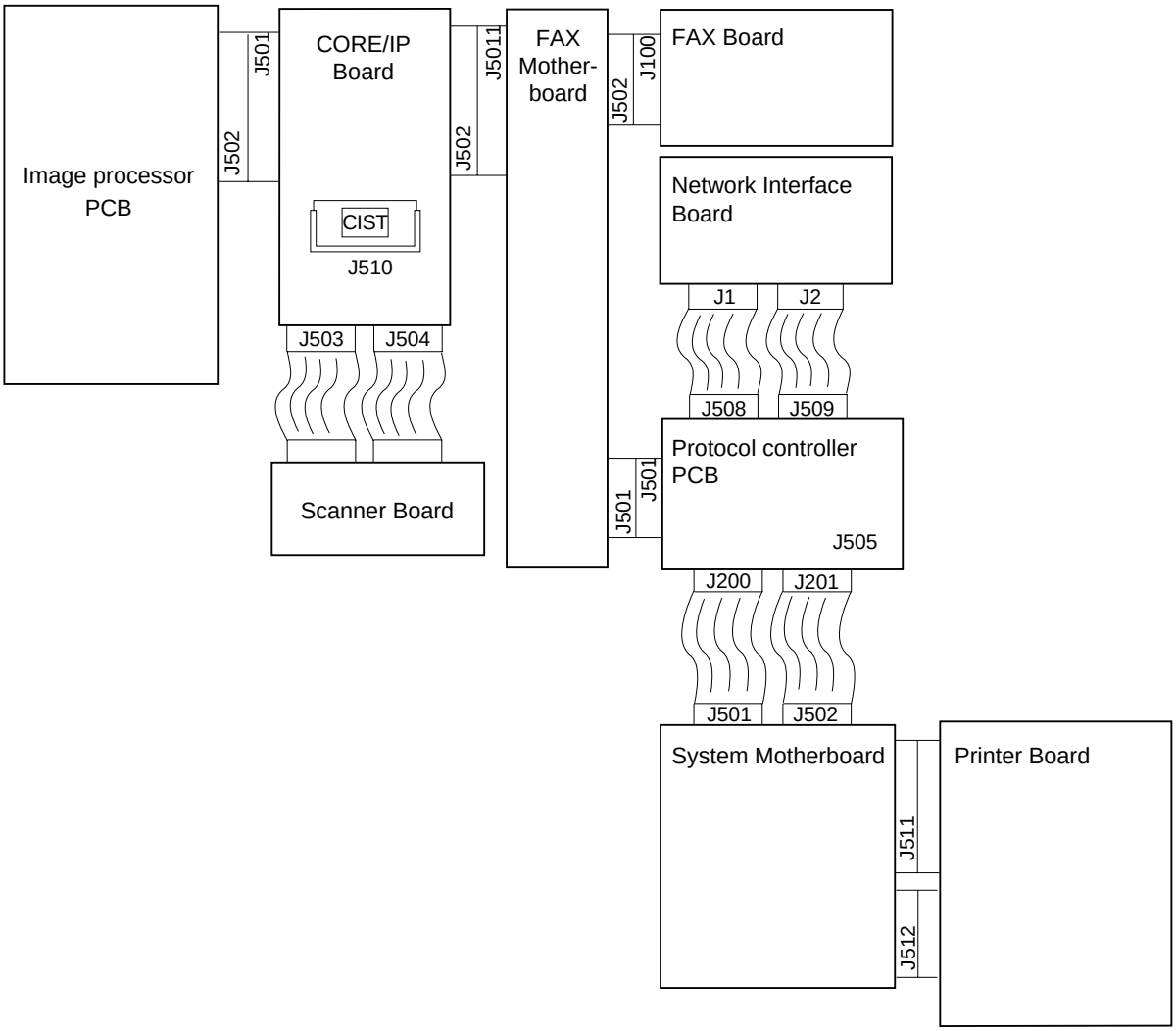
You must place the originals face down, and they will be read starting with the first page.

To collate the sheets of copy paper, they are turned over for delivery (face-down delivery). You may enable or disable this face-down delivery in copy specifications settings mode. (At time of shipment, ON is selected.)

When making two-sided copies, face-down delivery will not be executed regardless of the position of the switch.



B. Diagram of the Function Boards



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1. Functions

The CORE/IP Board, Protocol Controller PCB, and Scanner Board provide the functions discussed on the pages that follow.

a. CORE/IP Board

The CORE/IP Board processes and distributes image signals.

The board distributes image signals from the Image Processor PCB to the FAX Board or the Image Server. The board also serves to forward image signals from these boards to the image processor PCB.

The board processes image signals by an ED method (error diffusion); i.e., binary processing, resolution conversion, and reproduction ratio processing.

You may install an CIST Board equipped with the ability to convert printer images to 1200 × 600 dpi (main scanning × sub scanning).

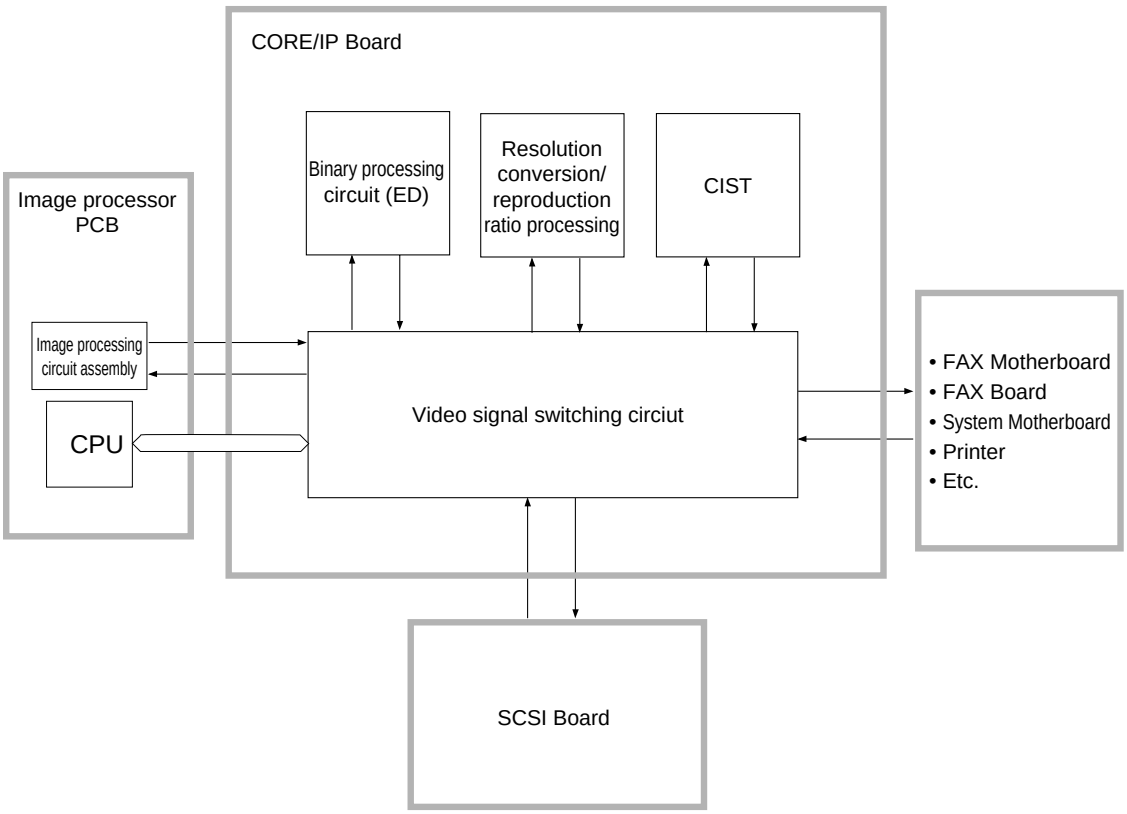

Fig. 3-905

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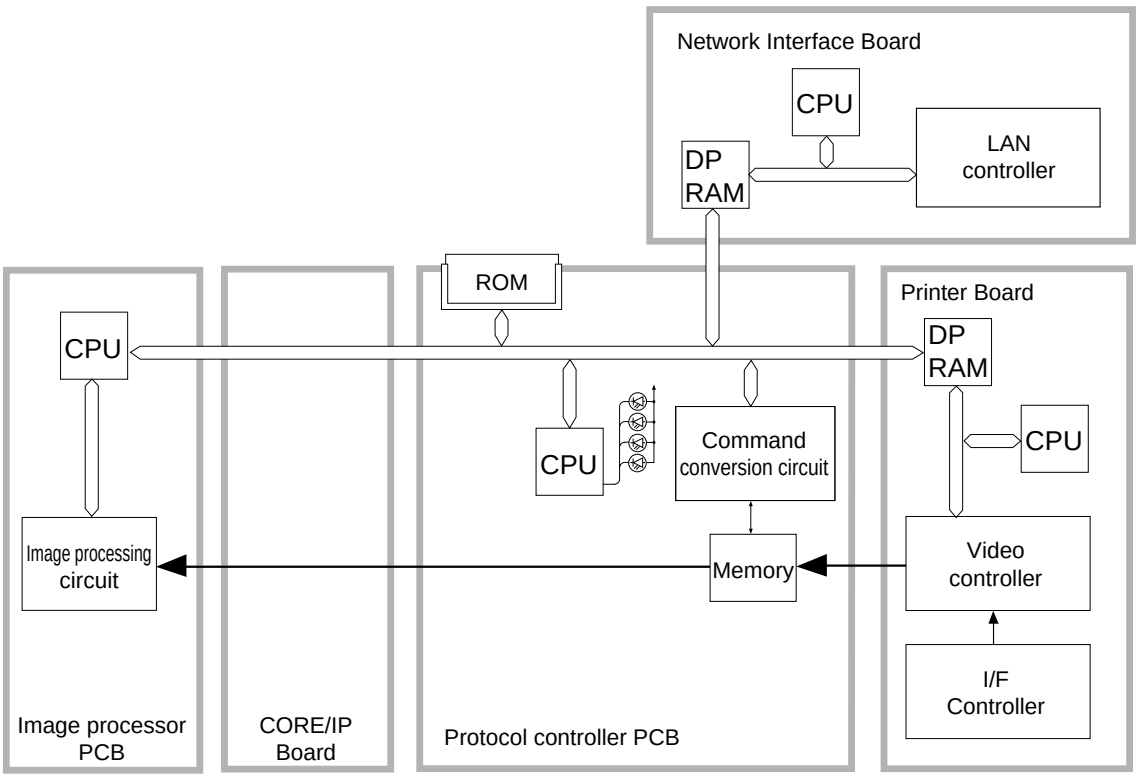
b. Protocol Controller PCB

In terms of PDL units, the Printer Board that may be installed to the machine may be a PS-PCL Board, PCL5e Board, or PS (kanji) Board. Of them, the three boards may be used in common with the Multi Device Controller, requiring conversion of printing commands (printer commands) and operation sequences to suit the operating environment of the GP215/GP200.

The Protocol Controller PCB converts printer commands from a personal computer to control the printer system of the GP215/GP200 to support GP215/GP200-specific multiple cassette functions not found in a configuration consisting of a Multi Device Controller and a GP55/GP30F.



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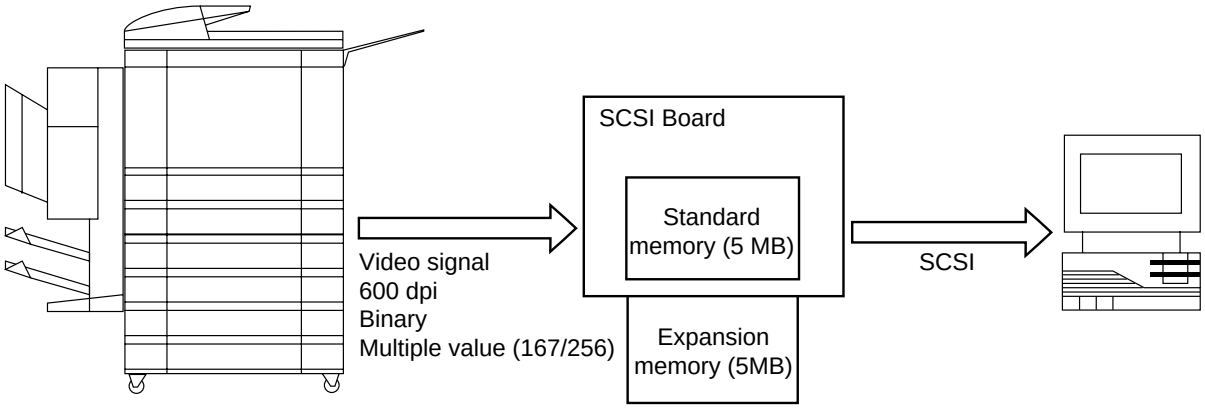
c. Scanner Board

The Scanner Board reads images read by the GP215/GP200 for transmission to the host computer through a SCSI interface, and it has the following specifications:

Interface	SCSI-Ⅱ
Maximum original size	A3; 297 × 420 mm/11”×17” 279×432mm (reading depends on size of memory)
Scanner resolution	600dpi
Reading mode	1-bit binary (ED) 4-bit multiple value (16 gradations) 8-bit multiple value (256 gradations)
Resolutions	2400dpi to 40dpi



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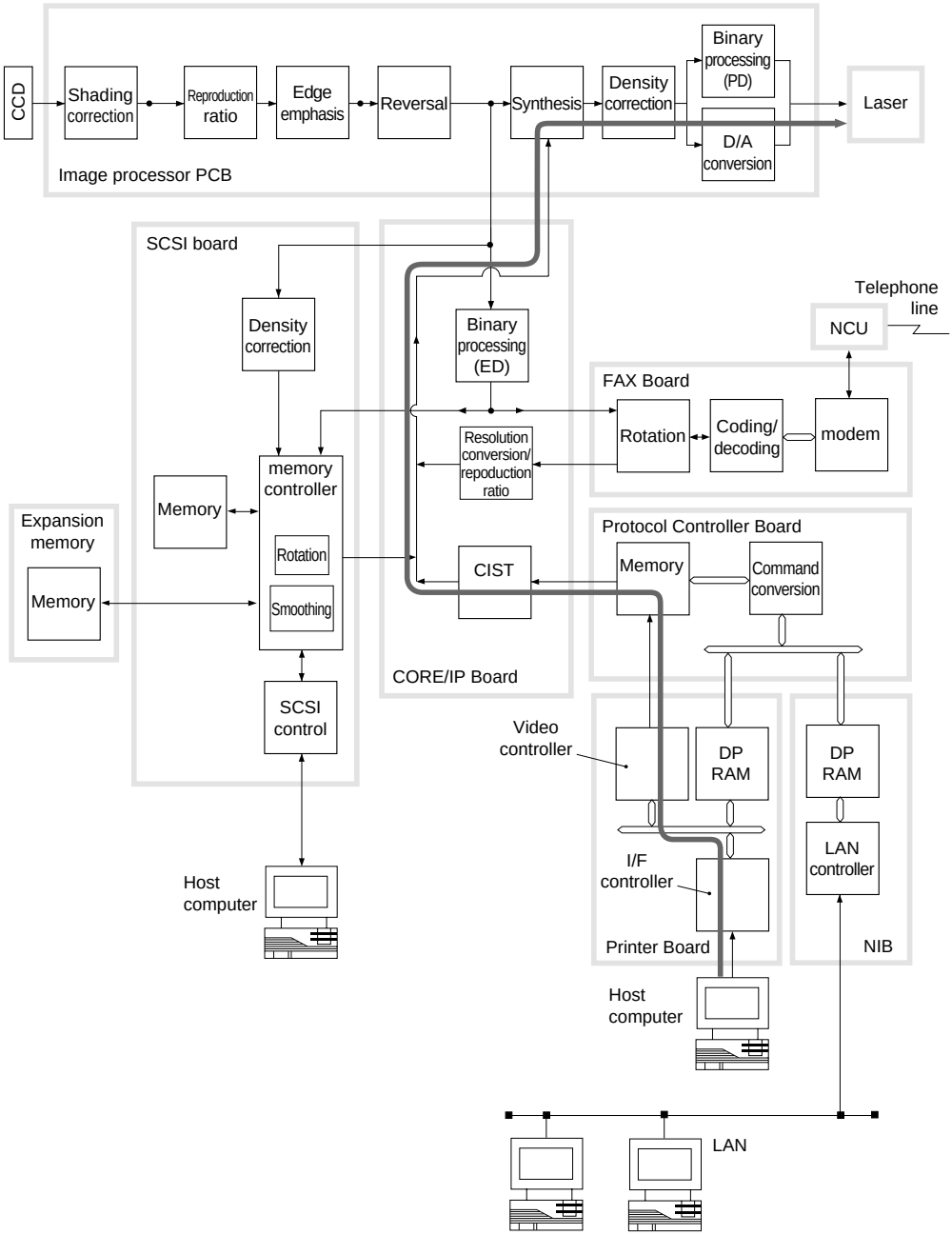
C. Flow of Image Signals

1. Flow of Image Signals from the Printer Board

The PDL data from the host computer is processed into printing images on the Printer Board and sent to the Protocol Controller PCB as image signals.

The image signals move through the Protocol Controller PCB to reach the CORE/IP Board. After resolution conversion, the image signals move to the Image processor PCB for printing.



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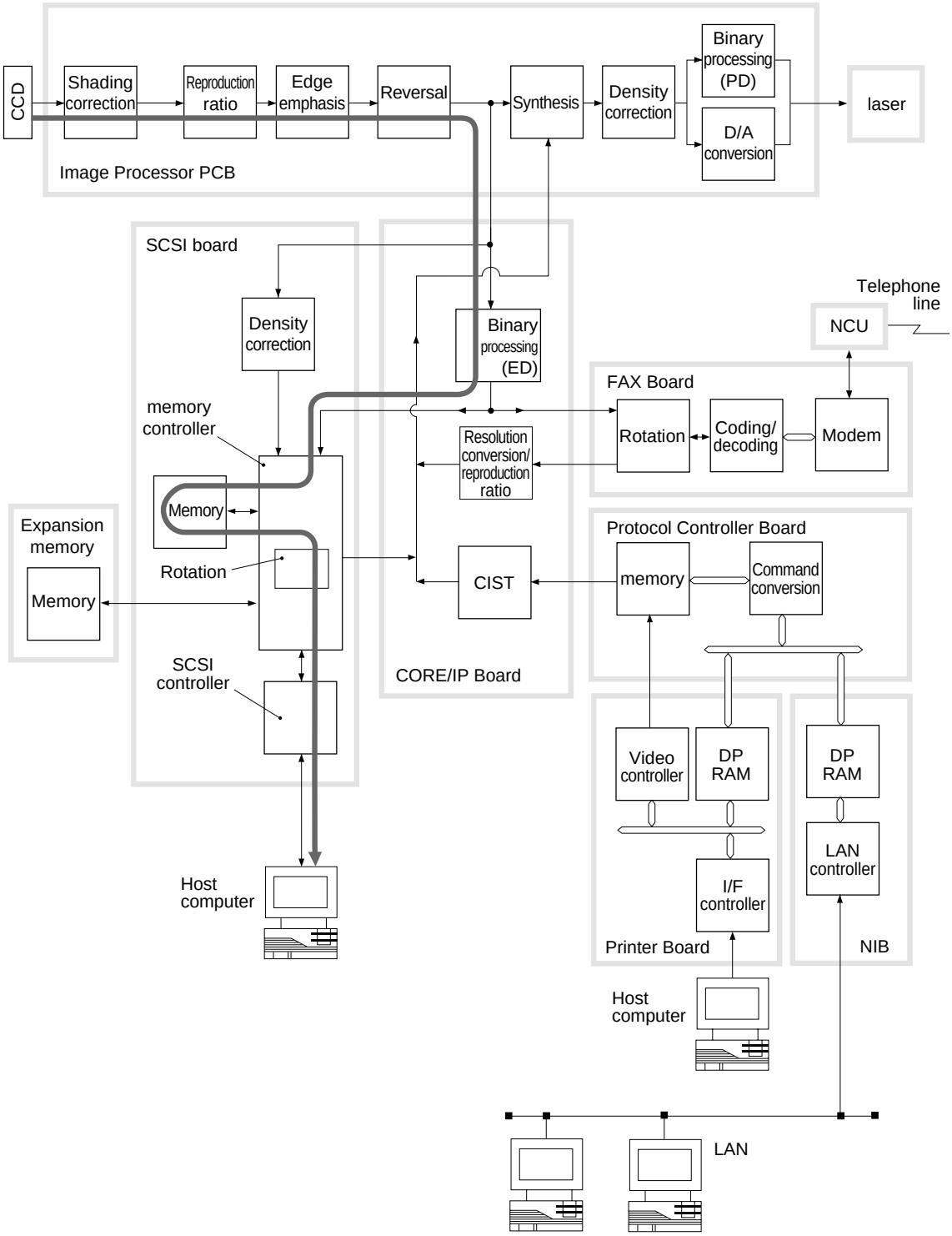
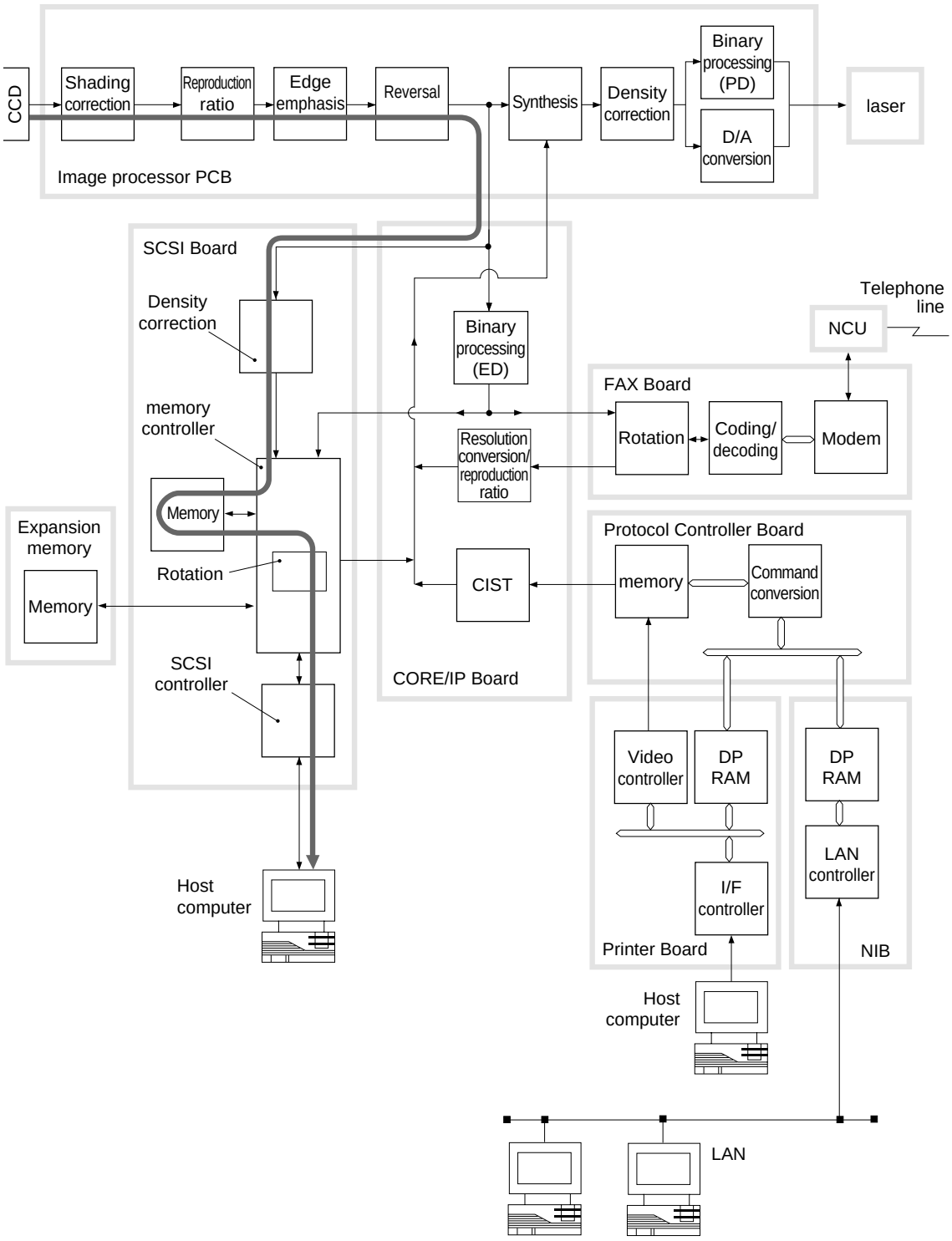
2. Flow of Image Signals to the Scanner Board

a. In the case of reading mode binary



b. In the case of reading mode multi-value



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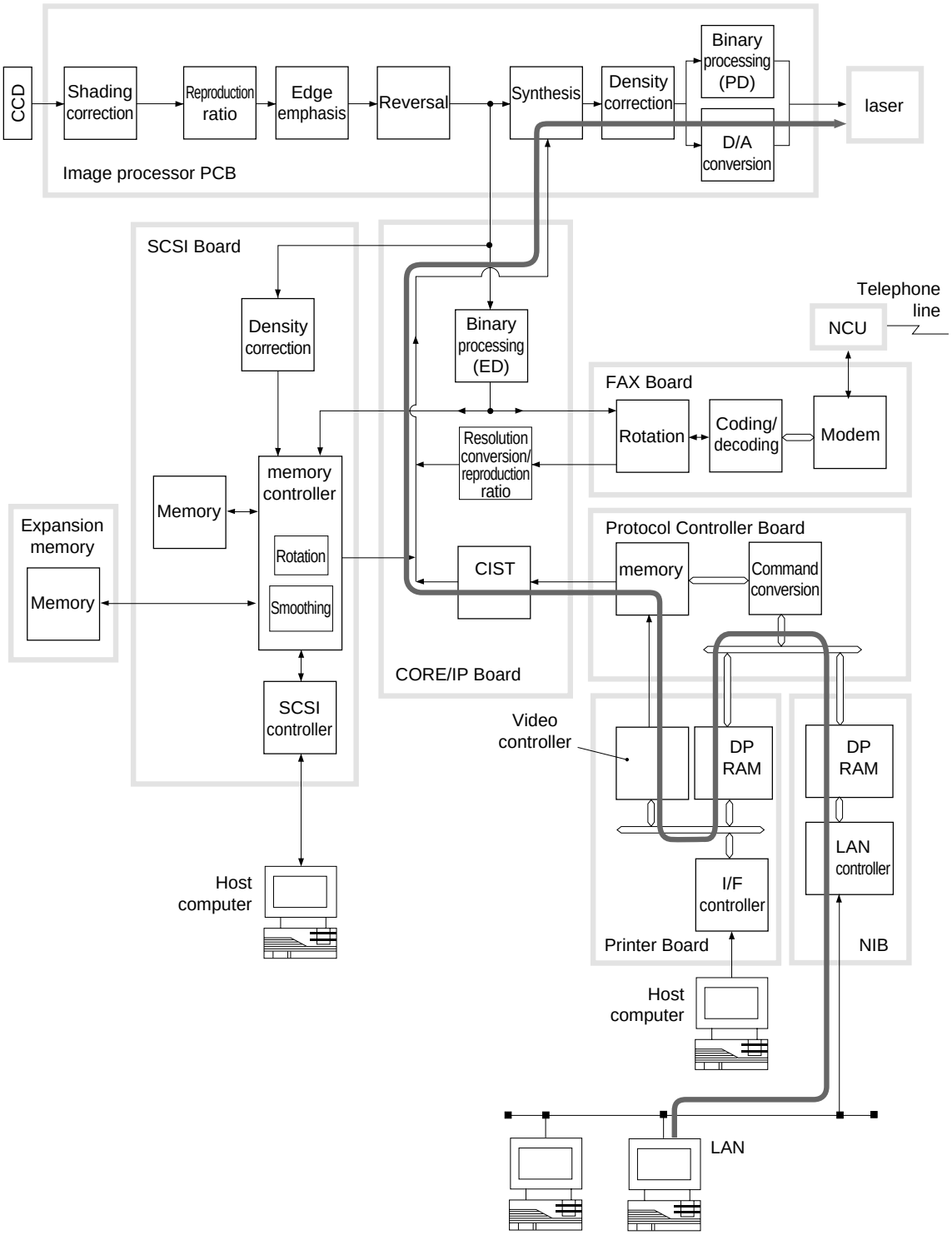
3. Flow of Image Signals for the Network Interface Board



X. SERVICE MODE

A. Outline

The machine's service mode is grouped into the following:

Item	Description
1 DIAPLAY	Display Mode • Indicates the values controlled by the CPU, nature of control, and version number of the ROM.
2 I/O DIAPLAY	I/O Display Mode • Indicates the elements controlled by the CPU or the input/output signals to and from options.
3 ADJUST	Adjustment Mode • Indicates items adjusted in service mode and allows changes to settings.
4 FUNCTION	Function Mode • Executes machine operations. Indicates items that may be automatically adjusted through execution from the screen.
5 OPTION	Settings Mode • Indicates items that may be changed for machine maintenance or items that may be changed to suit the needs of the user.
6 COUNTER	Counter Mode • Indicates the numbers of machine operations.
7 ACC	Options Mode • Indicates items for options, allowing changes to the settings.
8 FAX	Fax Service Mode • Indicates items to be set/changed or operated for fax functions from the screen.

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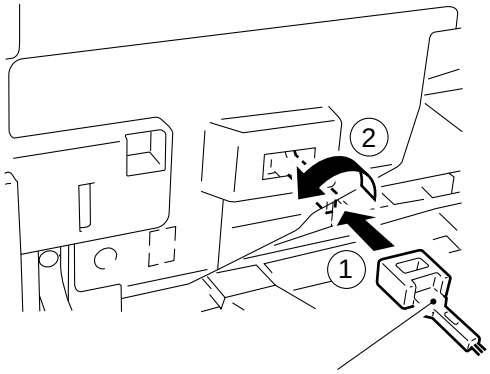
B. Using Service Mode

1. Starting Service Mode

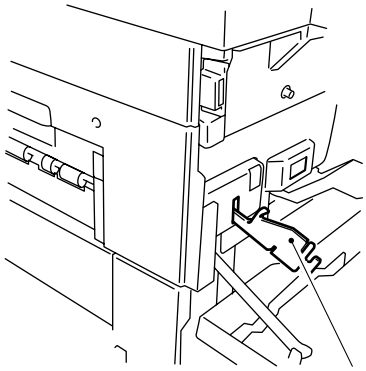
1) Open the front door, and insert the handle of the static eliminator cleaning brush into the fixing assembly releasing assembly.



Separation static eliminator cleaning brush

Figure 3-1001

2) Insert the door switch actuator into the door switch assembly.
(If you want to execute a specific mode such as 'I/O display' while making copies, see the appropriate copying modes.)

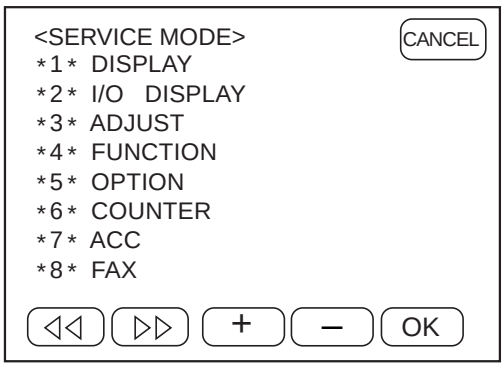


Door switch actuator

Figure 3-1002

3) Press the service switch with a hex key.
   - '$' will appear in the upper left corner of the LCD, indicating that the machine has started service mode.

4) Press the * key twice.
   - The LCD changes to the Service Mode Menu screen (initial screen).



5) Press the appropriate item to highlight.
6) Press the OK key to bring up the first screen of the selected screen.

2. Keys

You will be using the following keys:

- [▷▷]: Page Forward key; press it to bring up the next page.
- [◁◁]: Page Back key; press it to bring up the previous screen.
- [OK]: OK key; press it to accept a setting or execute an item.
- [CANCEL]: Cancel key; press it to bring up the high-order menu screen.
- [+]: + key; press it to move down the levels.
- [–]: – key; press it to move up the levels.

C. Using Adjustment Mode and Settings Mode

In adjustment mode (*3*; ADJUST) and in settings mode (*5*; OPTION), the settings changed/selected on the control panel are stored in RAM on the image processor PCB and operation/control is executed according to the settings. (These settings will be stored permanently when the main power switch is turned off and on after execution.

The factory default settings of adjustment mode (*3*; ADJUST) are recorded in the label (Figure 3-1001). Be sure to record any new settings if you made changes in the field. Further, you must enter the settings recorded on the label whenever you have cleared the RAM.

If you replaced the image processor PCB or the composite power supply PCB, be sure to enter the settings recorded on the respective label. (You need not do so when you have replaced only the ROM.)

MF-A6R				DVLP DC OFST				FILM LANK			
MF-A4R				H-ADJ				ABC_TBL			
MF-A4				V-ADJ				STRD_ADJ			
PRI DC (IMG)				REGIST				PPR			
PRI DC (on IMG)				RSIDE-SENSHP				W-PLT			
DVLP DC (IMG)				PVE-OFST				TRNS_1			
DVLP DC (on IMG)				IC-DENS				TRNS_2TS			
TRNS (IMG)				CST-LOOP				TRNS_2OL			
TRNS (on IMG)				MF-LOOP							
PRI AC (IMG)				DENS-ADJ							
PRI AC (on IMG)				ADJ-S							
AGS GAIN				LASER OFF							
AGS OFST				PWN 600 MIN							
PRI DC OFST				PWM 600 MAX							
PRI AC OFST1				PWM 200 MIN							
PRI AC OFST2				PWM 200 MAX							
TRNS OFST				AE-SLOP							
FL OFST				FIXER_RESIST							

Figure 3-1003 (Service Label; attached behind the front door)

P6L	
P6H	
P2L	
P2H	

Figure 3-1004 (Service Label; attached to the image processor PCB)

APVC GAIN	
APVC OFST	
PDC OFST	
PAC OFST1	
PAC OFST2	
ATVC OFST	
FL OFST	
DDC OFST	

Figure 3-1005 (Service Label; attached to the composite power supply PCB)

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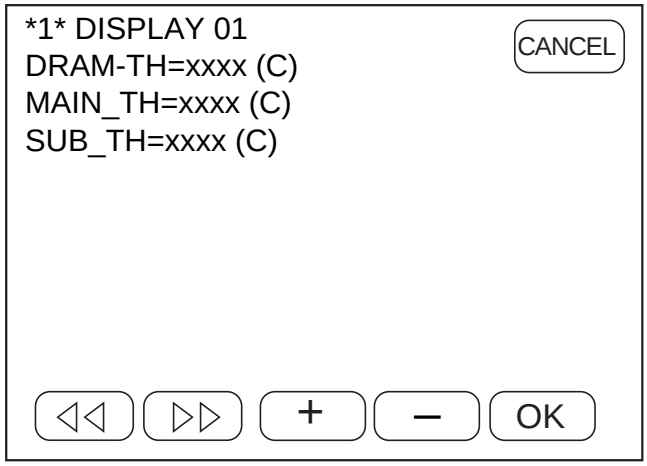
D. *1* DISPALY (control display mode)

- Use this mode to display the settings controlled by the CPU or the nature of control.
- You cannot change the displayed values or settings.
- Each press on the ▷▷ key brings up the next screen; each press on the ◁◁ key, on the other hand, brings up the previous screen.
- A press on the CANCEL key will bring up the Menu screen.

1. Temperature Indication (1st screen)



Item	Description	Remarks
DRAM_TH	Indicates the temperature around the photosensitive drum.	Unit: °C
MAIN_TH	Indicates the temperature at the middle of the fixing assembly. (output of thermistor TH1)	Unit: °C
SUB_TH	Indicates the temperature at the end of the fixing assembly. (output of thermistor TH2)	Unit: °C

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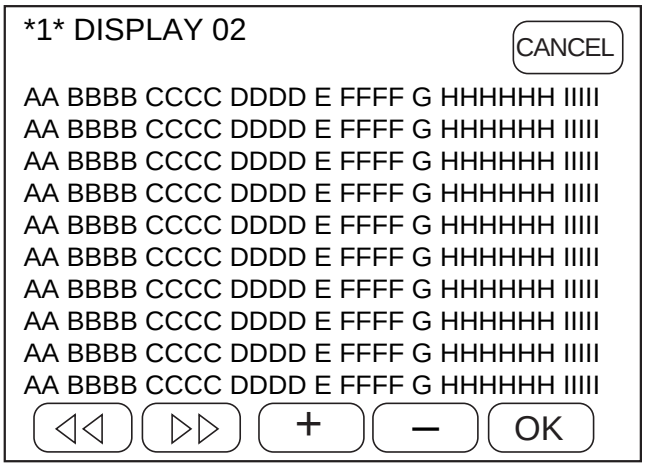
2. Jam History 1 (2nd screen)

- Use this mode to display a history of jams (jam data) covering the most recent 40 jams in reversed order of occurrence.



- Press the [+] or [–] key to scan through the levels (screen Nos. 11 through 20, 21 through 30, and 31 through 40).

Item	Description	
AA	Nos. 1 through 40 (higher the number, older)	
BBBB	Date of occurrence	Ex. '0801' for August 1
CCCC	Time of occurrence	Ex. '1012' for 10:12. (Indicates the time the machine entered standby state after jam removal.)
DDDD	Time of recovery	
E	Location 0: copier 1: feeder 2: sorter	
FFFF	Jam code high-order 2 digits: jam type. low-order 2 digits: sensor detecting the jam. (For details, see the next page.)	
G	Pick-up position (See the pages that follow.)	
HHHHHH	Pick-up soft counter	
IIIII	Paper size	

Sample Display 01 0821 1430 1435 0 0101 1 06543 000A4

- A4 paper jam
- soft counter reading of the source of paper
- 1st cassette
- jam code (pre-registration sensor delay jam)
- time of recovery (14:35)
- time of occurrence (14:30)
- date of occurrence (August 21)
- No.

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- A jam code is a 4-digit code, the high-order 2 digits indicating the type of jam and the low-order 2 digits, the sensor which detected the jam. Set the table below for level 1 classification of the jam codes.

Jam code FF	FF
High-order 2 digits	Low-order 2 digits
01: delay 02: stationary 10: residual (at power-on)	01: pre-registration sensor (PS5) 02: vertical path sensor (PS8) 03: vertical path sensor (pedestal; Q1603) 32: fixing delivery sensor (PS7) 33: delivery sensor (PS13) 34: delivery tray 2 paper sensor (multi tray 3; PS17) 35: delivery tray 3 paper sensor (multi tray 3; PS 18) 61: Multitray 3 inlet sensor (PS12) 63: re-pick up paper sensor (PS11)
11: door open	01: front door 02: right door 03: pedestal right door
00: multi tray 12/feeder	See p. 7-51.

Pick-Up Location Codes

Code	Pick-up location
1	Cassette 1
2	Cassette 2
3	Cassette 3
4	Cassette 4
5	Cassette 5
6	Cassette 6
8	Multifeeder
9	Two-sided/overlay re-pick up

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List of Jam Codes (copier-related)

Sensor / Low-order code / High-order code / Type of jam		Pre-registration sensor (PS5)	Vertical path sensor (PS8)	Pedestal vertical path sensor (Q1603)	Fixing delivery sensor (PS7)
		01	02	03	32
Delay	01	0101	0102	0103	0132
Stationary	02	0201	0202	0203	0232
Residual	10	1001	1002	1003	1032

Sensor / Low-order code / High-order code / Type of jam		Delivery sensor (PS13)	Multitray 3 delivery tray 2 paper sensor (PS17)	Multi tray 3 delivery tray 3 paper sensor (PS18)	Multitray 3 inlet sensor (PS19)
		33	34	35	61
Delay	01	0133	0134	0135	0161
Stationary	02	0233	0234	0235	0261
Residual	10	1033	1034	1035	1061

Sensor / Low-order code / High-order code / Type of jam		Duplexing unit inlet sensor (PS12)	Re-pick up sensor (PS11)
		62	63
Delay	01	0162	0163
Stationary	02	0262	0263
Residual	10	1062	1063

Door / Low-order code / High-order code / Type of jam		Front door	Right door	Pedestal right door
		01	02	03
Door open	11	1101	1102	1103

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Multitray 12-/Feeder-Related Jam Codes

Unit	Jam code	Description
Multitray-12	0003	Sorter feeding delay jam
	0004	Sorter feeding stationary jam
	0006	Sorter staple jam
	0007	Sorter power-on jam
	0008	Sorter door open jam (paper present)
	0009	Sorter door open jam (paper absent)
RDF	0001	Original pulled out
	0002	Registration delay jam
	0003	Pick-up delay
	0005	Registration delay
	0011	Reversal delay 1
	0012	Reversal stationary
	0013	Reversal delay 2
	0020	Reversal paper present
	0021	Reversal pick-up delay
	0023	Reversal pick-up stationary
	0041	Delivery delay
	0042	Delivery stationary
	0081	Opened with RDF in operation
	0082	Upper cover opened during operation
	0083	Original circulation fault
	0084	Original left behind
	0088	Original left behind on copyboard glass
	0089	Re-circulating lever fault

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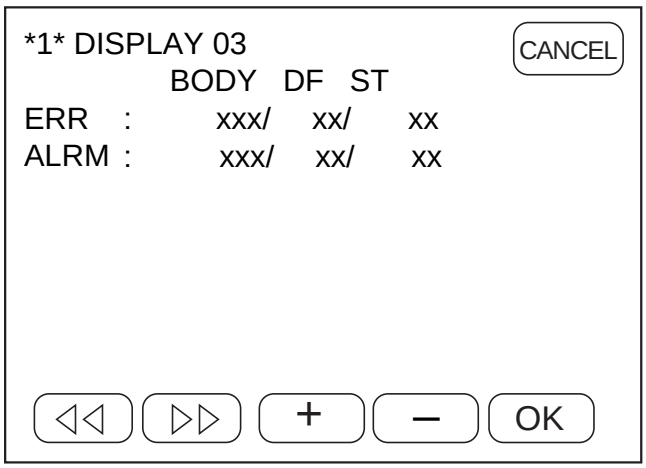
3. Error/Alarm Indication (4th screen)



Item	Description
ERR	See the descriptions (Table7-103) for self diagnosis (E code).
ALRM	See the table below for the nature of alarm.
BODY	Refers to the copier.
DF	Refers to the feeder (ADF/RDF).
ST	Refers to the sorter.

- Copier-Related Alarm

Code	Description
001	Replace the drum unit.

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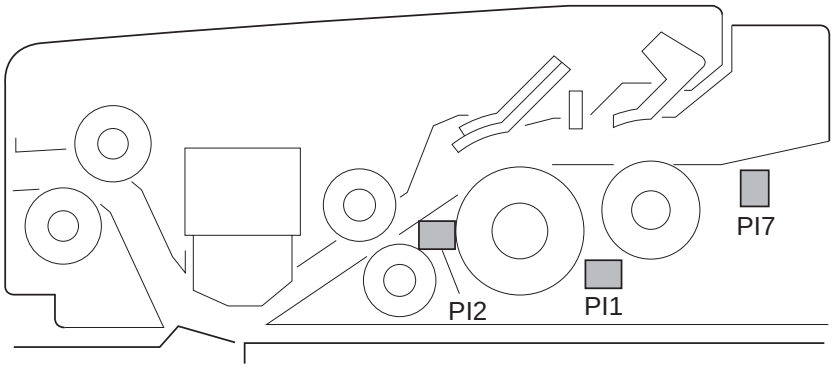
- ALARM (ADF)



PI1: ...Original sensor
PI2: ...Registration sensor
PI7: ...Original length sensor (S)

Fault	Sensor	Condition	Code
Separation delay	PI1, PI2	Both the original sensor (PI1) and the registration sensor (PI2) do not turn on within 2 sec after the main motor (M1) has turned on.	02H
Separation	PI1, PI2	Both the original sensor (PI1) and the registration sensor (PI2) do not turn ON 2 sec after the main motor (M1) has turned ON. (1st original only)	03H
Different number of originals after jam removal	PI7	The last original is detected before feeding the number of originals identified by the jam recovery mechanism.	11H
Original pulled	PI1	The original sensor (PI1) is OFF after pick-up operation (other than the last original).	13H
Original size	PI1, PI7	The original sensor (PI1) turns OFF for such originals as may be the last original (A5R, A4, B6R, B5, STMTR, LTR), but the detected original is not the last original.	14H

Note: The number in parentheses under the Code column is in decimal notation.

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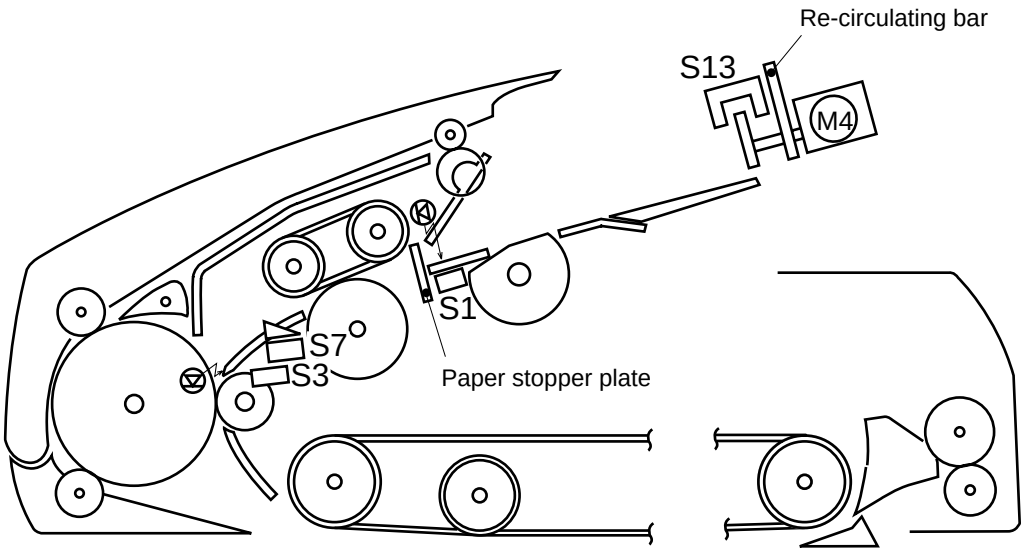
- ALARM (RDF)



S1 Original tray paper sensor
S3 Registration paper sensor
S7 Pick-up sensor
S13 Re-circulation sensor

Type	Sensor	Conditions	RF operation	Code
Re-circulating lever idle swing	S13	The re-circulating lever swung idly without coming into contact with an original immediately after the re-circulating motor (M4) has started to operate.	Stops immediately upon detection.	01H
Pick-up fault	S7	The sensor (S7) does not detect the leading edge of an original 1500 ms after pick-up.	The separation belt, feeding roller, and pick-up roller stop immediately. The RDF stops after delivering the copy of the advance original.	03H

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Type	Sensor	Conditions	RF operation	Code
Paper stopper plate override	S7	The original has ridden over the paper stopper plate when the original was set.	Stops immediately upon detection.	05H
Different number of originals after jam removal	S3	The number of originals on the original tray changed as follows: Number of originals copied > Number of originals set on tray See Supplement.	Stops immediately upon detection.	11H
Wrong number of originals	S3	The last original cannot be detected because the re-circulating lever does not fall through the original tray. **Reference:** Normally, the original tray holds 50 sheets of A5, STMT, A4, B5, or LTR, or 25 sheets of A3, B4, 11”x17”, or LGL.	Stops after counting the 100th original.	12H
Original forced off	S13	The re-circulating lever dropped through the original tray while an original was being processed.	Stops immediately upon detection.	13H
Wrong original size	S3	The original that has been picked up is of a non-default size.	Stops immediately upon detection.	14H
Wrong original size or mixed sizes in image composition mode (See Note 1.)	S3	① The original is of a size that image composition mode does not accommodate. ② The original is of a size different from the first original.	Stops immediately upon detection. See Supplement.	15H
Not reset when mode is changed	—	① When executing fax mode without resetting after copying mode. ② When making a copy in the middle of fax operation or when making a copy without resetting after fax mode.	Stops operation immediately upon detection.	21H

Note1:
To reset, remove the originals from the original tray and then open the RDF.

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• Overstacking Alarm (Multitray-12)

Code	Nature	Cause	Operation	Display	Resetting
02H	Overstacking of paper	The paper being stacked during multitray operation has exceeded the capacity of a single bin.	Stops upon detection overstacking.	Indicates a message on the copier's control panel.	Remove all paper from the bin.

• Partial Fault Alarm (Multitray-12)

Code	Nature	Cause	Operation	Display	Resetting
10H	Partial fault	An error occurred in the bin unit feeding motor (M2), bin shift motor (M1), guide bar swing motor (M4), or stapler swing motor (M5); the same type of error has occurred after turning off and on the power.	Prohibits delivery to the sorter; however, permits delivery to the tray.	No indication.	Remove the cause of the error, and turn off and then on the power.

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• Stapler Alarm (Multitray-12)

Code	Nature	Cause	Operation	Display	Resetting
02H	Staple jam	• The stapler safety sensor (MS6) has turned on for some reason. • The stapler is not securely installed. • Normal stapling operation is not possible.	Stops stapling.	• Flashes the Manual Staple key. • Indicates a message on the copier's control panel.	• Wait until the machine automatically recovers (about 1 sec after the stapler safety sensor turns off). • Open and then close the stapler cover.
03H	Stapling safety protection mechanism activation	The stapler safety sensor (MS6) has turned on during stapling operation.	Stops stapling.	No indication.	Remove the cause that turned on the stapler safety sensor (MS6); wait until the machine recovers automatically in about 1 sec after the stapler safety sensor turns off.
05H	Over stapling capacity	The volume of paper in a single bin has exceeded the maximum value (20 sheets) in stapler sort mode.	Finishes sorting but stops without stapling.	Indicates a message on the copier's control panel.	Remove all paper (stack).
06H	Full stapling capacity	The volume of paper in a single bin has reached the maximum value (20 sheets) in stapler sorter mode.	Operates normally.	No indication.	Remove all paper (stack).
07H	Mixed paper sizes	Sheets of different widths have been placed in the bin.	Finishes sorting but stops without stapling.	No indication.	Remove all paper (stack).
09H	Paper in bin	Paper is remaining inside the bin.	Indicates a message if stapler sorter mode is selected; otherwise, operates normally.	• Turns on the Manual Staple key. • Indicates a message on the copier's control panel if stapler sorter mode is selected in this condition.	Remove all paper (stack).
0AH	Staple absent	The stapler has run out of staples.	Prohibits stapling.	Indicates the Add Staple message.	Replace the staple cartridge.

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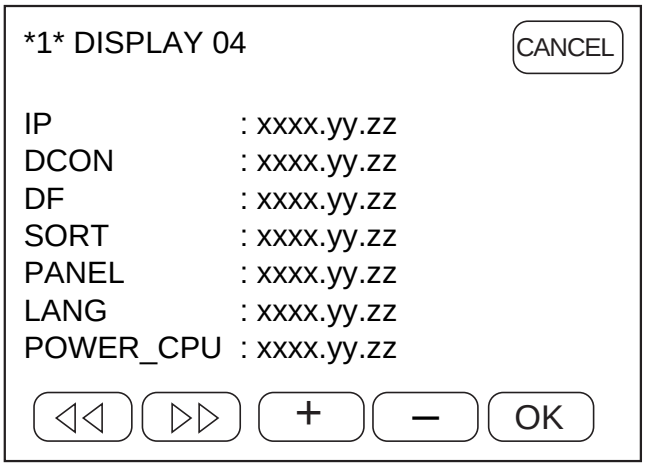
4. Version Indication 1 (5th screen)



Guide to Version Numbers
xxxx: type of software
yy: version number
zz: R&D control number

Item	Description
IP	Indicates the version number of the ROM DIMM on the image processor PCB.
DCON	Indicates the version number of the EPROM (IC103, IC104) on the DC controller PCB.
DF	Indicates the version number of the ROM on the feeder (ADF, RDF) controller.
SORT	Indicates the version number of the ROM on the sorter controller PCB.
PANEL	Indicates the version number of the ROM on the CPU PCB of the control panel.
LANG	Indicates a specific language: COMMON JAPANESE ENGLISH FRENCH GERMAN DANISH DUTCH FINNISH ITALIAN NORWEGIAN PORTUGUESE SPANISH SWEDISH
POWER_CPU	Indicates the version number of the CPU on the composite power supply PCB.

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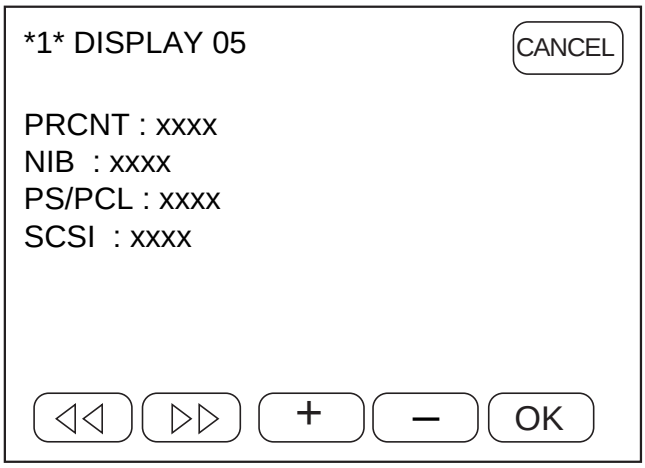
5. Version Indication 2 (5th screen)

The indication is given when an expansion board is installed and, therefore, no indication appears in the absence of such a board.



Item	Description
PRCNT	Indicates the version number of the Protocol Control PCB.
NIB	Indicates the version number of the Network Interface Board (NIB).
PS/PCL	Indicates the version number of the Printer Board (PS/PCL).
SCSI	Indicates the version number of the SCSI Board.

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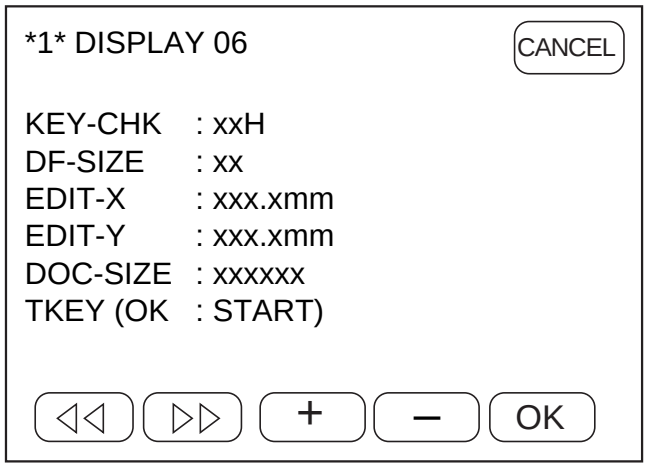
6. Key/Editor Indication (7th screen)



Item	Description
KWY-CHK	Indicates the code of a specific key that is being pressed (except the Reset key). (See the next page.)
DF-SIZE	Indicates the size of the original detected by the ADF or the RDF.
EDIT-X EDIT-Y	Indicates the editor input coordinates. EDIT-X: X direction EDIT-Y: Y direction
DOC-SIZE	Indicates the size of the original detected by the original size sensor.
TKEY	Touch Panel • Press 'TKEY' to highlight; then, press the OK key (All messages turn OFF.). Then, when the touch panel is pressed the area will become highlighted (reverse video). After the check, press the Reset key to end service mode.

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KEK-CHK code

Key	Code
Keypad 0	30
Keypad 1	31
Keypad 2	32
Keypad 3	33
Keypad 4	34
Keypad 5	35
Keypad 6	36
Keypad 7	37
Keypad 8	38
Keypad 9	39
Start	50
Stop	51
*	2A
#	23
Clear	3A
Interrupt	53
Guide	54
User Mode	03

One-Touch key	Code
1	00
2	01
3	02
4	03
5	04
6	05
7	06
8	07
9	08
10	09
11	10
12	11
13	12
14	13
15	14
16	15
17	16
18	17
19	18
20	19

One-Touch key	Code
21	20
22	21
23	22
24	23
25	24
26	25
27	26
28	27
29	28
30	29
31	30
32	31
33	32
34	33
35	34
36	35
37	36
38	37
39	38
40	39

One-Touch key	Code
41	40
42	41
43	42
44	43
45	44
46	45
47	46
48	47
49	48
50	49
51	50
52	51
53	52
54	53
55	54
56	55
57	56
58	57
59	58
60	59

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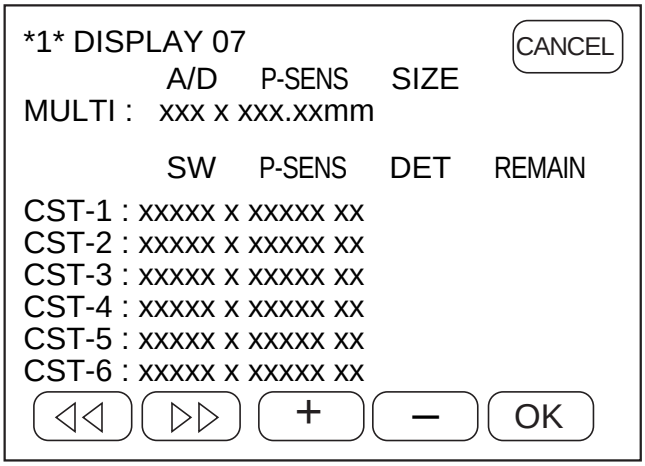
7. Copy Paper Size Indication

Use this mode to indicate the size of copy paper set in the multifeeder or in the cassettes and the output readings of the paper size sensors.



Item	Descriptions
MULTI	Refers to the multifeeder.
A/D	Indicates the output (analog) of the multifeeder width sensor.
P-SENS	Indicates the presence/absence of paper. 0: paper absent. 1: paper present.
SIZE	Indicates the A/D input value of the multifeeder in mm.
SW	Refers to a specific cassette (cassette size sensor output; rear to Table 0-00).
DET	Indicates the paper size.
REMAIN	Indicates the volume of paper inside the cassette: 00: full (500 sheets) 10: much 11: little (about 10 mm high) 01: little/absent
CST-1	Cassette 1
CST-2	Cassette 2
CST-3	Cassette 3
CST-4	Cassette 4
CST-5	Cassette 5
CST-6	Cassette 6

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List of Cassette Sizes

Configuration	Cassette	Cassette code
AB	Cassette absent	11111
	A5	10010
	A5R	10000
	A4	10001
	A4R	10101
	A3	10100
	B5	10110
	B5R	10111
	B4	10011
	U1: FLSC OFICIO A-OFI E-OFI B-OFI A-LGL	11011
	U2 FOLIO	11010
	U3 A-FLS	11000
	SPECAL1	11101
	SPECAL2	11100
	Envelope 1	11110
Inch	Cassette absent	11111
	STMT	00010
	STMTR	00000
	LTR	00001
	A-LTR	
	LTRR	00101
	A-LTRR	
	LGL	00100
	11*17	00110
	U4 G-LTR	00111
	U5 G-LTRR	00011
	U6 G-LGL	01011
	U7 K-LGL	01010
	U8 K-LGLR	01000
	SPECAL1	01101
	SPECAL2	01100
	Envelope 2	01110

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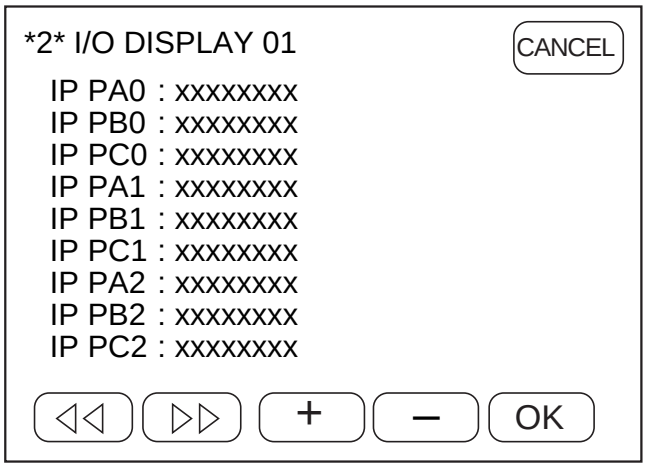
E. *2* I/O DISPLAY (I/O display mode)

- Use this mode to indicate the input/output states of the input/output ports of the CPU.
- You cannot change the indicated values/settings.
  Each press on the [▷▷] key brings up the next screen; each press on the [◁◁] key, on the other hand, brings up the previous screen.
- A press on the [CANCEL] key will bring up the Menu screen.

1. Inputs/Outputs to and from the Image Processor PCB (1st screen)



Guide to the Screen

IP PA0:XXXXXXX

bit 7 ..... bit 0

Address	bit	Indication	Signal	Jack	Logic
PA0 (input)	0 1 2 3 4 5 6 7	PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal Not used. Not used.			
PB0 (input)	0 1 2 3 4 5 6 7	CORE/IP connect 1 CORE/IP connect 2 editor board connect CCF connect PCB internal signal power saving mode switch Not used. main power switch			0: not connected 1: not connected 0: connected 0: connected 0: ON 0: ON

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Address	bit	Indication	Signal	Jack	Logic
PC0 (input)	0 1 2 3 4 5 6 7	DIP SW DIP SW DIP SW DIP SW DIP SW DIP SW Not used. Not used.			
PA1 (output)	0 1 2 3 4 5 6 7	LCD back light CCV count sleep mode switch PCB internal signal DIP SW DIP SW DIP SW interrupt			1: ON 1: count 0: saving mode 0: connect 0: ON 1: ON (DC controller communication)
PB1 (output)	0 1 2 3 4 5 6 7	scanner start registration roller ON PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal			1: ON (DC controller communication) 1: ON (DC controller communication)
PC1	0 1 2 3 4 5 6 7	 PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal			1: ON 1: ON
PA2 (output)	0 1 2 3 4 5 6 7	PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal PCB internal signal			

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Address	bit	Indication	Signal	Jack	Logic
PB2 (output)	0 1 2 3 4 5 6 7	STOP B/H ABC OFF CS LD/RS CLK SIN/UD PRESCAN			CCD control CCD control CCD control CCD control CCD control CCD control CCD control CCD control
PC2 (output)	0 1 2 3 4 5 6 7	bias ON power SW 0 marker ON PAD OFF power SW1 area signal switching Not used.. Post ratio change reversal switching			laser control laser control for editing board for editing board laser control 1: w/ editing board installed

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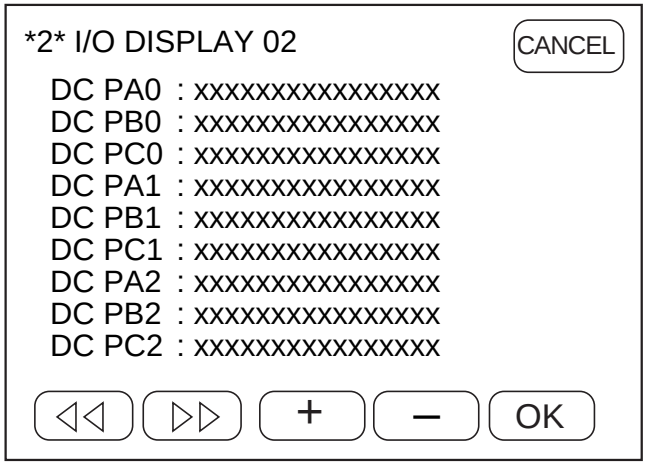
2. Inputs to and Outputs from the DC Controller PCB



Guide to the Screen

DC PA0:XXXXXXXXXXXXXXXX

bit 15 ..... bit 0

Address	bit	Indication	Signal	Jack	Logic
PA0 (input)	0		FDD	J109-3	1: film detected
	1		CBCC	J113-B9	1: closed
	2		MFPD	J113-A11	0: paper present
	3		PDP1	J113-A5	1: paper present
	4		—	—	
	5		PDP3	J109-6	1: paper present
	6		UCSPD	J114-10	1: paper not present
	7		LCSPD	J114-A11	1: paper not present
	8		VPPD	J114-A12	1: paper present
	9		PDP4	J114-A2	1: paper present
	10		RDOP	J113-A8	1: right door close
	11		WTDT	J113-B6	0: waste toner full
	12		TEP	J117-7	1: toner present
	13		MLCK	J114-B7	1: locked
	14		LOCK	J112-6	1: locked
	15		—	—	
PB0 (input)	0		CSZ10	J110-2	
	1		CSZ11	J110-3	
	2		CSZ12	J110-4	
	3		CSZ13	J110-5	
	4		CSZ14	J110-6	
	5		CSZ20	J110-8	
	6		CSZ21	J110-9	
	7		CSZ22	J110-10	
	8		CSZ23	J110-11	
	9		CSZ24	J110-12	
	10				
	11				
	12				
	13				
	14				
	15				

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Address	bit	Indication	Signal	Jack	Logic
PC0 (input)	0	re-pick up unit front paper detection (PS11)	PDP5	J103-2	0: paper present
	1	duplexing unit inlet paper detection (PS12)	PDP6	J105-B2	0: paper present
	2	delivery paper detection (PS13)	PDP7	J105-A2	0: paper present
	3	bin 2 paper detection		J104-4	
	4	bin 3 paper detection		J104-5	
	5	bin 3 inlet paper detection		J104-6	
	6	horizontal registration paper detection (PS14)	CRGPD	J114-B2	
	7	bin 3 tray position detection		J104-7	1: lower feeding assembly present
	8	lower feeding assembly ID	—		1: lower feeding assembly inlet present
	9	lower feeding assembly inlet unit ID			1: Multitray 3 connected
	10	Multitray 3 ID			
	11	Not used.			
	12	Not used.			
	13	Not used.			
	14	Not used.			
	15	Not used.			
PA1 (output)	0	main motor drive	MMD	J114-B6	0: rotates
	1	laser scanner motor drive	RSMD	J112-7	1: rotates
	2	registration clutch drive	RGCD	J114-B11	0: ON
	3	multifeeder pick-up clutch	MFCD	J114-B9	0: ON
	4	vertical path roller clutch	CL3D	J114-A4	0: ON
	5	developing clutch	DVCD	J113-B14	0: ON
	6	pick-up roller DOWN solenoid	SL2D	J114-A5	0: ON
	7	multifeeder holding plate releasing solenoid	PRDSD	J114-B13	0: ON
	8	counter 1 drive	CNT1D	J107-B4	1: count
	9	counter 2 drive	CNT2D	J107-B6	1: count
	10	cassette pedestal communication signal	CHOEN	J106-11	
	11	bin 3 shift tray drive		J104-8	
	12	re-pick up paper deflecting plate solenoid	PFLD	J103-5	0: ON
	13	paper deflecting plate 2 solenoid		J104-9	0: ON
	14	delivery assembly paper deflecting plate solenoid	DFLD	J105-A5	0: ON
	15	bin 3 flapper solenoid		J104-10	
PB1 (output)	0	pick-up motor drive	A	J114-A6	
	1	pick-up motor drive	B	J114-A7	
	2	pick-up motor drive	M0	J114-A8	
	3	pick-up motor drive	M1	J114-A9	
	4	fixing film drive	A	J109-10	
	5	fixing film drive	A*	J109-11	
	6	fixing film drive	B	J109-12	
	7	fixing film drive	B*	J109-13	
	8	horizontal registration drive	A	J115-3	
	9	horizontal registration drive	A*	J115-4	
	10	horizontal registration drive	B	J115-5	
	11	horizontal registration drive	B*	J115-6	
	12	feeding fan drive	FFMD	J107-A8	
	13	exhaust fan 1 drive		J107-A9	
	14	laser cooling fan drive		J113-B3	
	15	PCB internal signal	—	—	

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Address	bit	Indication	Signal	Jack	Logic
PC1 (output)	0	set-back motor drive	A	J103-6	
	1	set-back motor drive	A*	J103-7	
	2	set-back motor drive	B	J103-10	
	3	set-back motor drive	B*	J103-11	
	4	duplexing unit inlet motor drive	A	J105-B4	
	5	duplexing unit inlet motor drive	A*	J105-B5	
	6	duplexing unit inlet motor drive	B	J105-B8	
	7	duplexing unit inlet motor drive	B*	J105-B9	
	8	delivery reversing motor drive	A	J105-A6	
	9	delivery reversing motor drive	A*	J105-A7	
	10	delivery reversing motor drive	B	J105-A10	
	11	delivery reversing motor drive	B*	J105-A11	
	12	bin 3 drive motor	A	J104-11	
	13	bin 3 rive motor	A*	J104-12	
	14	bin 3 drive motor	B	J104-13	
	15	bin 3 drive motor	B*	J104-14	
PA2	0	scanner motor drive (PCB internal signal)			
	1	scanner motor drive (PCB internal signal)			
	2	scanner motor drive (PCB internal signal)			
	3	scanner motor drive (PCB internal signal)			
	4	scanner motor drive (PCB internal signal)			
	5	scanner motor drive (PCB internal signal)			
	6	scanning reference signal (PCB internal signal)			
	7	scanning reference signal (PCB internal signal)			
	8	scanning reference signal (PCB internal signal)			
	9	scanning reference signal (PCB internal signal)			
	10	Not used.			
	11	re-pick up clutch drive	CLSD	J122-6	
	12	pre-exposure lamp drive	PEXP	J107-A12	
	13	Not used.			
	14	fixing heater relay drive	HRRD	J107-B9	
	15	image processor communication signal		J111-35	
PB2 (input)	0	PCB internal signal			
	1	PCB internal signal			
	2	PCB internal signal			
	3	PCB internal signal			
	4	Not used.			
	5	Not used.			
	6	Not used.			
	7	Not used.			
	8	Not used.			
	9	Not used.			
	10	Not used.			
	11	Not used.			
	12	Not used.			
	13	Not used.			
	14	Not used.			
	15	Not used.			

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Address	bit	Indication	Signal	Jack	Logic
PC2 (output)	0	PCB internal signal			
	1	PCB internal signal			
	2	PCB internal signal			
	3	primary charging roller cleaning solenoid	PCLSD	J113-B2	0: ON
	4	counter 3 drive (115/230V model)	CNT3D	J107-B8	1: ON
	5	electrical unit fan drive (option)		J112-9	
	6	exhaust fan 1 half-speed (PCB internal signal)			
	7	laser fan half-speed (PCB internal signal)			
	8	electrical unit fan half-speed (PCB internal signal)			
	9	exhaust fan 2 drive		J107-B1	
	10	exhaust fan half-speed (PCB internal signal)			
	11	Not used.			
	12	Not used.			
	13	Not used.			
	14	Not used.			
	15	Not used.			

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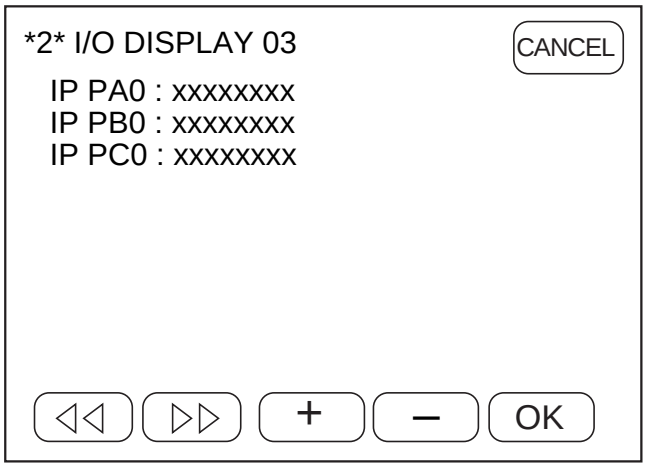
3. CPU Input/Output Ports of the DC Controller



Address	bit	Indication	Signal	Jack	Logic
PA0	0	primary charging DC bias switching	HVPH	J102-B9	
	1	developing bias DC application mode	HADCH	J102-B8	
	2	transfer output mode 0	HVYM0	J102-B7	
	3	transfer output mode 1	HVTM1	J102-B6	
	4	primary charging roller ON/OFF	HVPDC	J102-B5	
	5	static eliminator ON/OFF	HVD1	J102-B4	
	6	laser scanner motor reference clock	FS	J112-8	
	7	developing AC drive	ACON	J102-B3	
PB0	0	scanner motor reference clock (PCB internal signal)			
	1	scanner motor CW/CCW rotation (PCB internal signal)			
	2	composite power supply PCB communication signal	ACK	J102-A6	
	3	zero cross	ZC	J102-A8	
	4				
	5	developing DC drive	CDON	J102-B2	
	6	Not used.			
	7	Not used.			
PC0	0	composite power supply PCB communication signal	REQ	J102-A7	
	1	Not used.	UCRMN		
	2	upper cassette paper detection 0	UCRMN LCRMN	J122-1	
	3	upper cassette paper detection 1	LCRMN	J122-2	
	4	lower cassette paper detection 0		J122-3	
	5	lower cassette paper detection 1		J122-4	
	6	Not used.			
	7	Not used.			

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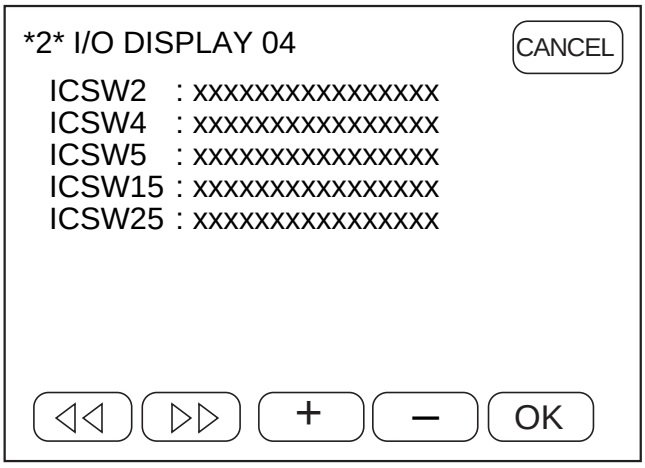
4. Gate Array Input/Output of the DC Controller PCB



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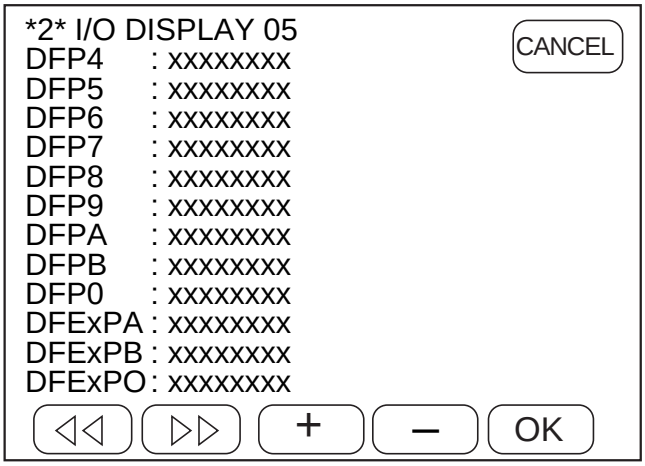
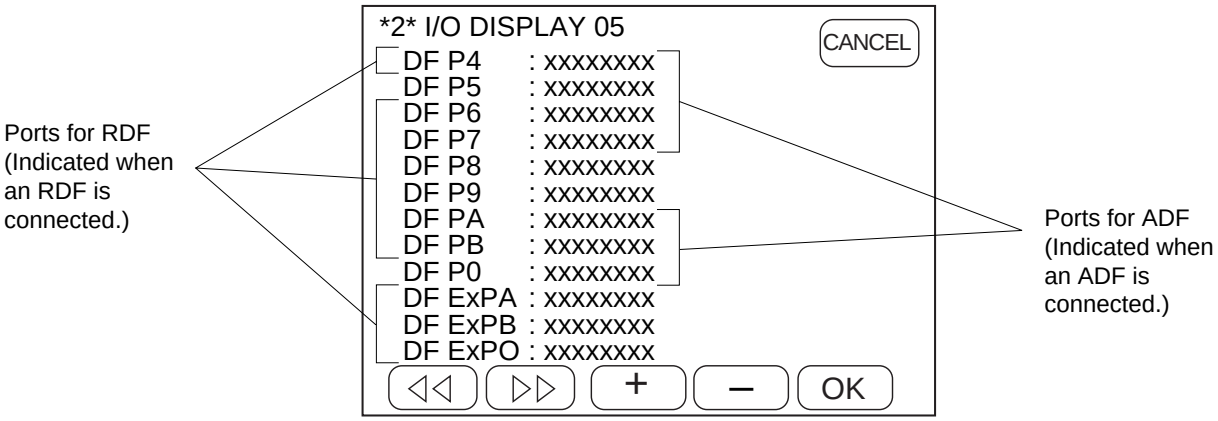
5. Input/Output Port 1 of the Feeder



Guide to the Screen



a. Input/Output Ports of the RDF (1/2)

Address	bit	Indication	Signal	Jack	Logic
DFP4 (output)	0	stopper plate solenoid (SL1)	STPSL	J5-10	1: ON
	1	paper deflecting plate solenoid (SL3)	DFSLD	J4-2	1: ON
	2	stamping solenoid (SL4)	STSLD	J14-5	1: ON
	3	Not used.			
	4	Not used.			
	5	Not used.			
	6	Not used.			
	7	Not used.			
DFP6	0	pick-up roller sensor (S5)	PUSP	J5-2	1: paper present
	1	delivery sensor 1 (S6)	PSP3	J9-6	1: paper present
	2	pick-up sensor (S7)	PDP1	J9-9	1: paper present
	3	Not used.			
	4	PCB internal signal			
	5	PCB internal signal			
	6	Not used.			
	7	Not used.			
DFP7	0	original sensor (S1)	DEP1	J5-1	1: paper present
	1	registration sensor (S3)	PDP2	J9-20	1: paper present
	2	original width detecting VR	DMPW	J8-8	A/D value stored in adjustment mode
	3	Not used.			
	4	reversal sensor (S8)	RVPD	J9-12	1: paper present
	5	delivery sensor 2 (S12)	PDP4	J8-2	1: paper present
	6	original tray paper sensor (LED1)			1: light ON
	7	registration sensor (LED2)			1: light ON
DFP8	0	belt motor clock sensor (S10)	BMCLK	J9-18	alternates 1 and 0 during rotation
	1	feeding motor clock sensor (S9)	FMCLK	J9-15	alternates 1 and 0 during rotation
	2	registration roller clock sensor (S11)	RRCLK	J5-5	alternates 1 and 0 during rotation
	4	PCB internal signal			
	4	PCB internal signal			
	5	Not used.			
	6	Not used.			
	7	Not used.			
DFP9	0	copier communication signal			
	1	copier communication signal			
	2	copier communication signal			
	3	Not used.			
	4	copier communication signal			
	5	Not used.			
	6	Not used.			
	7	Not used.			

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a. Input/Output Ports of the RDF (2/2)

Address	bit	Indication	Signal	Jack	Logic
DFPA	0	PCB internal signal			
	1	Not used.			
	2	PCB internal signal			
	3	belt motor drive signal			1: ON (PCB internal signal)
	4	PCB internal signal			
	5	feeding motor drive signal			1: ON (PCB internal signal)
	6	PCB internal signal			
	7	pick-up motor			1: ON (PCB internal signal)
DFPB	0	PCB internal signal			1: belt motor CW rotation
	1	PCB internal signal			1: pick-up motor CW rotation
	2	PCB internal signal			
	3	original detection LED	DSD	J8-4	1: ON
	4	PCB internal signal			
	5	brake	BKD	J6-2	1: ON
	6	clutch	CLD	J13-2	1: ON
	7	paper retaining solenoid (SL2)	WSLD	J5-12	1: ON
DF ExPA	0	push switch (SW1)	SW1		1: pressed
	1	push switch(SW2)	SW2		1: pressed
	2	push switch (SW3)	SW3		1: pressed
	3	re-circulation sensor (S13)	LDD	J14-1	1: paper present
	4	upper cover switch (MS2)	UPCC1	J3-2	1: closed
	5	RDF switch (MS1)	RFC	J2-6	1: closed
	6	PCB internal signal			
	7				
DF ExPB	0	LED (PCB internal signal)			
	1	LED (CPB internal signal)			
	2	Not used.			
	3	Not used.			
	4	Not used.			
	5	Not used.			
	6	Not used.			
	7	Not used.			
DF ExPO	0	DDIP SW1			1: ON
	1	DIP SW2			1: ON
	2	DIP SW3			1: ON
	3	DIP SW4			1: ON
	4	DIP SW5			1: ON
	5	DIP SW6			1: ON
	6	DIP SW7			1: ON
	7	DIP SW8			1: ON

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b. Input/Output Ports of the ADF (1/2)

Address	bit	Indication	Signal	Jack	Logic
DFP4	0	PCB internal signal			
	1	ADF open/closed sensor (PI6)	ADFC	J4-3	1: ADF closed
	2	original sensor (PI1)	PDP1	J5-12	1: paper present
	3	registration sensor (PI2)	PDP2	J5-9	1: paper present
	4	cover open/closed sensor (PI3/4)			0: open
	5	delivery sensor (PI5)	PDP3	J6-6	1: paper present
	6	LED1			
	7	LED2			
DFP5	0	LED3			
	1	LED4			
	2	PCB internal signal			
	3	PCB internal signal			
	4	PCB internal signal			
	5	PCB internal signal			
	6	PCB internal signal			
	7	PCB internal signal			
DFP6	0	main motor drive A			0: PCB internal signal
	1	main motor drive A*			0: PCB internal signal
	2	main motor drive B			0: PCB internal signal
	3	main motor drive B*			0: PCB internal signal
	4	motor current control			1: PCB internal signal
	5	paper stopper plate solenoid (SL1)	SPSLD	J8-1	0: ON
	6	stamping solenoid (SL2)	SMSLD	J6-7	0: ON
	7	PCB internal signal			
DFP7	0	original leading edge signal		J2-5	communication signal
	1	PCB internal signal			
	2	original indicator LED drive (LED4)			1: ON
	3	Not used.			
	4	Not used.			
	5	PCB internal signal			
	6	PCB internal signal			
	7	PCB internal signal			
DFPA	0	DIP SW 1			
	1	DIP SW 2			
	2	DIP SW 3			
	3	DIP SW 4			
	4	DIP SW 5			
	5	DIP SW 6			
	6	push switch 2			0: ON
	7	push switch 1			0: ON

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b. Input/Output Port of the ADF (2/2)

Address	bit	Indication	Signal	Jack	Logic
DFPB	0	PCB internal signal			
	1	PCB internal signal			
	2	PCB internal signal			
	3	PCB internal signal			
	4	PCB internal signal			
	5	PCB internal signal			
	6	PCB internal signal			
	7	PCB internal signal			
DFP0	0	original width detection 2	SW72	J7-2	
	1	original width detection 1	SW71	J7-3	
	2	original width detection 3	SW73	J7-4	
	3	original width detection 4	SW74	J7-5	
	4	original length detection 1 (PI9)	DLDL	J5-2	
	5	original length detection 1 OPI8)	DLDM	J5-3	
	6	original length detection 1 (PI7)	DLDS	J5-4	
	7	PCB internal signal			

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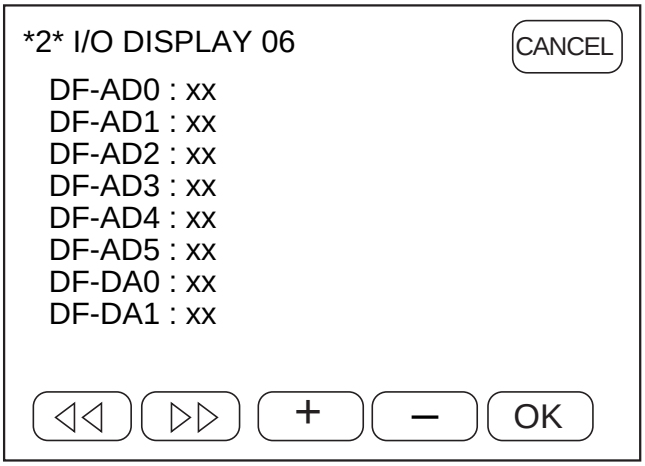
6. Input/Output Port 2 of the Feeder



a. RF Input/Output Ports

Address	Indication	Signal	Jack	Logic
DF-AD0	Original sensor (S1)	DEP1	J5-7	In hexadecimal notation.
DF-AD1	Registration sensor (S3)	PDP2	J9-20	In hexadecimal notation.
DF-AD2	Original width volume (VR1)	DMPS	J8-8	In hexadecimal notation.
DF-AD3	Not used			
DF-AD4	Not used			
DF-AD5	Not used			
DF-DA0	Original tray sensor LED1 ON signal			
DF-DA1	Registration sensor LED3 ON signal			

b. ADF Input/Output Port

Address	Indication	Signal	Jack	Logic
DF-AD0	Not used			
DF-AD1	Not used			
DF-AD2	Not used			
DF-AD3	Not used			
DF-AD4	Not used			
DF-AD5	Not used			
DF-DA0	Not used			
DF-DA1	Not used			

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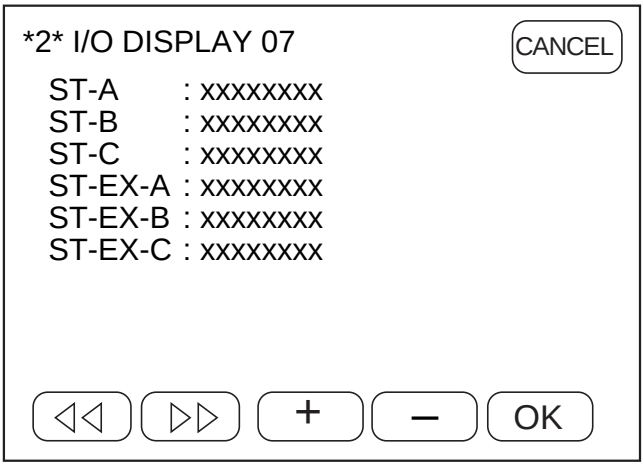
7. Input/Output Port 1 of the Sorter



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a. Multi-Output Tray-1/2 Input/Output Ports (1/2)

Address	Bit	Indication	Signal	Jack	Logic
ST-A	0	Guide bar motor drive signal 1			Pulse signal
	1	Guide bar motor drive signal 2			Pulse signal
	2	Guide bar motor drive signal 2			Pulse signal
	3	Guide bar motor drive signal 4			Pulse signal
	4	Guide bar motor drive signal ON signal			1: motor ON.
	5	Stapler motor drive signal 1			1: motor CW.
	6	Stapler motor drive signal 2			1: motor CCW.
	7	Stapler swing motor drive signal			1: motor ON.
ST-B	0	Sorter feeding motor drive signal			Pulse signal
	1	Tray feeding motor drive singal			Pulse singal
	2	Not used			
	3	Add Staple LED ON/OFF	STEMP	J9-5	0: ON.
	4	Stapler LED ON/OFF	SPLOK	J9-4	0: ON.
	5	Not used			
	6	Paper on tray indicator	TRIND	J15-1	1: ON.
	7	PCB internal signal			
ST-C	0	Not used			
	1	PCB internal signal			
	2	Bin feeding motor clock (PI2)	BFMC	J8-2	Pulse input
	3	Not used			
	4	Tray feeding motor clock (PI6)	TFMC	J11-11	Pulse input
	5	Lead cam HP sensor (PI1)	LCHP	J8-4	1: Lead cam horizontal.
	6	PCB internal signal			
	7	Bin unit delivery sensor (P3)	BPDY	J9-1	0: paper detected
ST-EX-A	0	Not used			
	1	Not used			
	2	Not used			
	3	Not used			
	4	Not used			
	5	Not used			
	6	Not used			
	7	Not used			
ST-EX-B	0	Stapler cover open/closed detection (MS5)	SPLON	J17-2	1: Open.
	1	Joint sensor (MS3)	TOP	J3-3	1: Released.
	2	Stapler safety sensor (MS6)	SPLSFT	J17-4	1: Safety switch ON.
	3	Stapler position sensor (PI4)	SPLPD	J17-3	0: At HP.
	4	Tray position detection (PI12)	TRP	J12-7	1: At HP.
	5	Guide bar HP sensor (PI5)	GBHP	J4-6	1: At HP.
	6	Stapler HP sensor (MS4)	SPUHP	J17-3	1: At HP.
	7	Stapling HP sensor (MS7)	SPLHP	J7-8	1: At HP.

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a. Multi-Output Tray-1/2 Input/Output Ports (2/2)

Address	Bit	Indication	Signal	Jack	Logic
ST-EX-C	0	Not used			
	1	PCB internal signal			
	2	PCB internal signal			
	3	Tray B paper detection (PI11)	TBPD	J12-4	1: Paper present.
	4	Tray A paper detection (PI10)	TAPD	J12-1	1: Paper present.
	5	Tray B discharge paper detection (PI9)	TBP	J11-14	1: Paper detected.
	6	Tray A delivery detection (PI8)	TAP	J11-8	1: Paper detected.
	7	Tray feeding assembly inlet slot sensor (PI7)	TFPD	J11-5	1: Paper detected.

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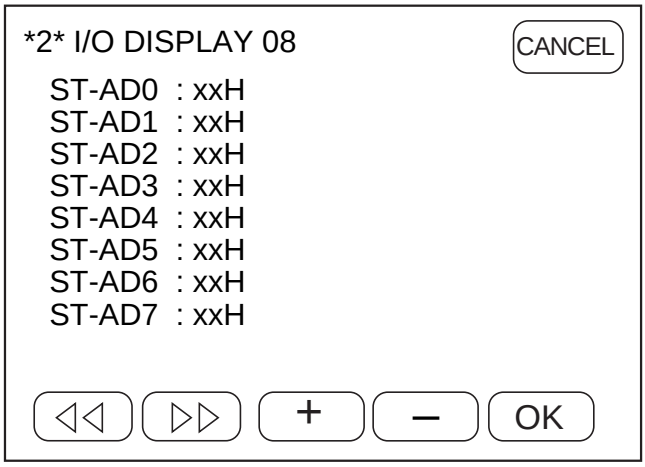
8. Input/Output Port 2 of the Sorter



b. Multi-Output Tray 1/2 Input/Output Ports

Address	Indication	Signal	Jack	Logic
ST-AD0	24V monitor			
ST-AD1	Bin paper sensor (PT1)	BPDN	J4-4	Analog input
ST-AD2	Not used			
ST-AD3	For factory/R&D			
ST-AD4	Staple key	MNSPT	J9-6	0: Key ON.
ST-AD5	Push SW (SW2)			0: SW2 pressed.
ST-AD6	Push SW (SW1)			0: SW1 pressed.
ST-AD7	Staple absent			1: Staple absent.

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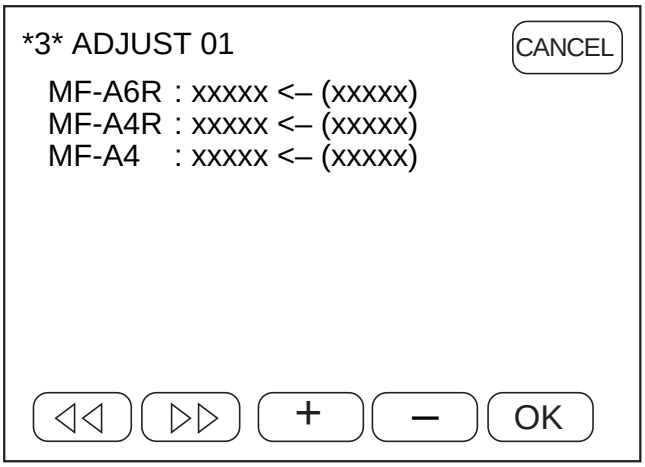
F. *3* ADJUST (adjustment mode)

- Use this mode to fine-adjust or set back-up data needed for copying operations.
- Each press on the [▷▷] key brings up the next screen; each press on the [◁◁] key, on the other hand, brings up the previous screen.
- Press the item you want to adjust or set (notation) to highlight.
- Use the keypad to enter numbers.
- Press the [OK] key to accept the selected setting.
- Record all new settings on the service label.
- When done, turn off and then on the main power switch.

1. Fine-Adjusting and Entering the Multifeeder Paper Width Basic Setting



Item	Description	Remarks	Settings
	Use it to fine-adjust or enter the multi-feeder paper width basic setting.	If you have replaced the image processor PCB, be sure to enter the value recorded on the service label. For how to enter a new value after replacement of the paper width sensor, see service handbook p. 2-15.	0~65535
MF-A6R	MF-A6R: Indicates the stored A6R (105mm) value of the multifeeder paper width sensor.		
MF-A4R	MF-A4R: Indicates the stored A4R (210mm) value of the multifeeder paper width sensor.		
MF-A4	MF-A4: Indicates the stored A4 (297mm) value of the multifeeder paper width sensor.		

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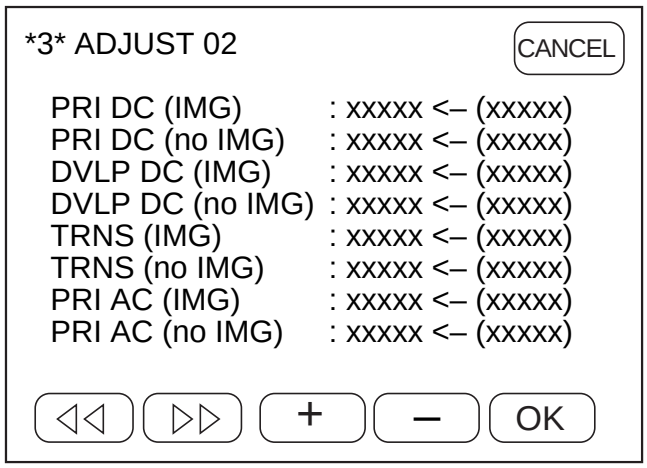
2. Primary Charging Roller/Transfer Charging Roller/Developing Bias


3 ADJUST 02
CANCEL
PRI DC (IMG) : xxxxx <– (xxxxx)
PRI DC (no IMG) : xxxxx <– (xxxxx)
DVLP DC (IMG) : xxxxx <– (xxxxx)
DVLP DC (no IMG) : xxxxx <– (xxxxx)
TRNS (IMG) : xxxxx <– (xxxxx)
TRNS (no IMG) : xxxxx <– (xxxxx)
PRI AC (IMG) : xxxxx <– (xxxxx)
PRI AC (no IMG) : xxxxx <– (xxxxx)
+
–
OK

Item	Description	Remarks	Settings
PRI DC (IMG)	Indicates the primary charging DC output effective when an image is exposed.	If you have replaced the image processor PCB, be sure to enter the value recorded on the service label.	0~65535
PRI DC (no IMG)	Indicates the primary charging DC output between sheets.		
DVLP DC (IMG)	Indicates the developing DC output while an image is exposed.		
DVLP DC (no IMG)	Indicates the developing DC output between sheets.		
TRNS (IMG)	Indicates the transfer charging DC output while an image is exposed.		
TRNS (no IMG)	Indicates the transfer charging DC output between sheets.		
PRI AC (IMG)	Indicates the primary charging AC output while an image is exposed.		
PRI AC (no IMG)	Indicates the primary charging AC output between sheets.		

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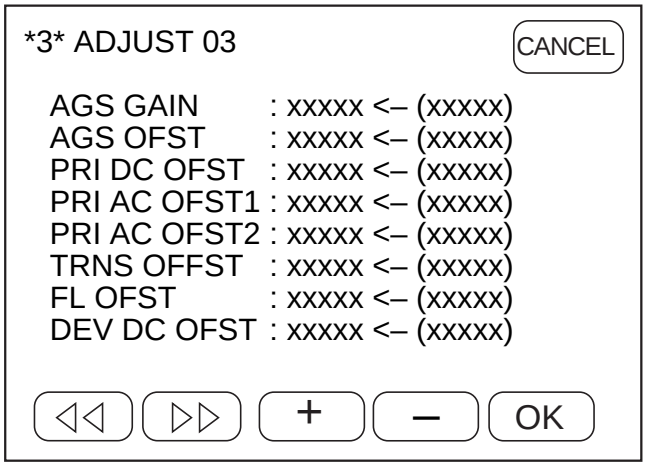
3. Back-Up Data for the Composite Power Supply PCB


3 ADJUST 03
CANCEL
AGS GAIN : xxxxx <– (xxxxx)
AGS OFST : xxxxx <– (xxxxx)
PRI DC OFST : xxxxx <– (xxxxx)
PRI AC OFST1 : xxxxx <– (xxxxx)
PRI AC OFST2 : xxxxx <– (xxxxx)
TRNS OFFST : xxxxx <– (xxxxx)
FL OFST : xxxxx <– (xxxxx)
DEV DC OFST : xxxxx <– (xxxxx)
+
–
OK

Item	Description	Label*	Remarks	Settings
AGS GAIN	Indicate APVC gain.	APVC GAIN	If you have replaced the composite power supply PCB, be sure to enter the value recorded on the label attached to the composite power supply PCB. (see P3-160)	0~255
AGS OFST	Indicates APVC offset.	APVC OFST		
PRI DC OFST	Indicates primary charging DC offset.	PDC OFST		
PRI AC OFST1	Indicate primary charging AC offset 1.	PAC OFST1		
PRI AC OFST2	Indicates primary charging AC offset 2.	PAC OFST2		
TRSN OFFST	Indicates transfer charging offset.	ATVC OFST		
FL OFST	Indicates scanning lamp offset.	FL OFST		
DEV DC OFST	Indicates developing bias DC component offset.	DDC OFST		

* Service Label; attached to the composite power supply PCB.

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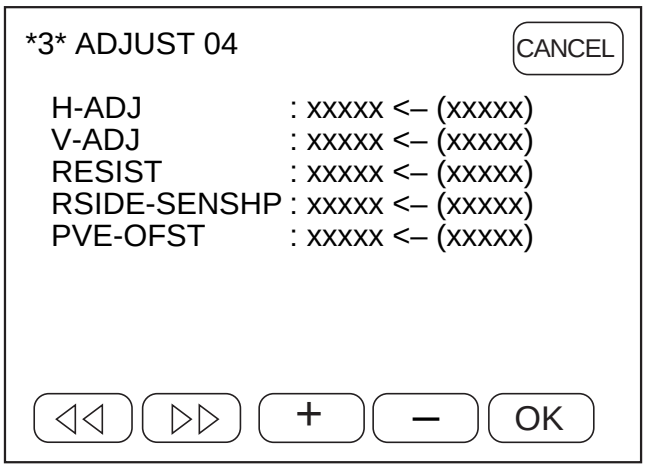
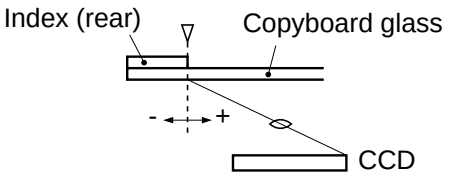
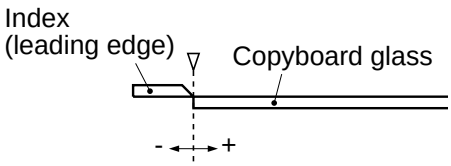


4. Registration-Related Items

Item	Description	Settings	Remarks
H-ADJ	Use it to fine-adjust the CCD reading start position (main scanning direction; book mode)  A higher setting shifts the read start position to the right.	0~500	unit:1mm (approx.; at 23)
V-ADJ	Use it to adjust the image reading start position (sub scanning direction).  A higher setting delays the registration ON timing.	0~1000	unit: 1mm (approx.; at 23)
RESIST	Use it to adjust the registration clutch ON timing (leading edge margin).	0~1000	Standard: 2.5 ±1.0 mm

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Item	Description	Settings	Remarks
RSIDE-SENSHP	Use it to make adjustments if images on paper picked up from the lower feeding assembly (2nd side of overlay/two-sided copies) are often displaced to the rear or front. • If the displacement is to the rear, decrease the value (in units of 23, a single unit being equivalent to 1 mm). • If the displacement is to the front, increase the value (in units of 23, a single unit being equivalent to 1 mm).	0~65535 Within ±46 (23x2) of the factory adjustment value.	
PVE-OFST	Use it to correct offset from the laser center. • If you have initialized the RAM or replaced the image processor PCB, enter the value recorded on the service label.	–200~+200	

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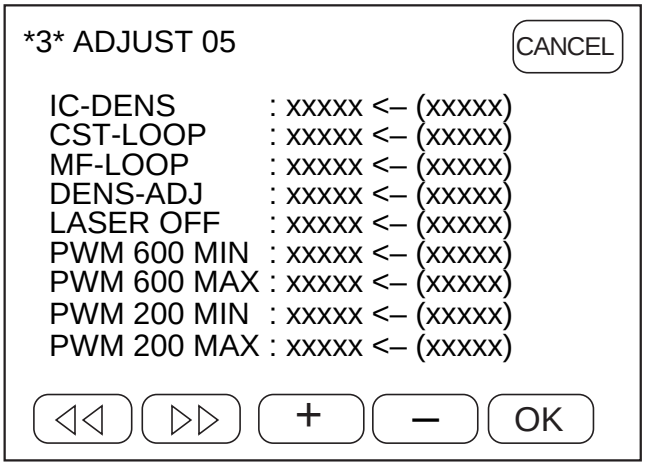
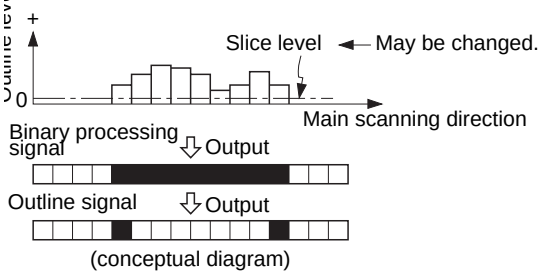
5. Scanner-, Cassette-, and Laser-Related Items



Item	Description	Settings	Remarks
IC-DENS	Use it to adjust the original slice level in image create mode (with the Image Editing Board installed).  (conceptual diagram)	50~200	
CST-LOOP	Use it to adjust arching (cassette pick-up; for factory use).	0~65535	
MF-LOOP	Use it to adjust arching (multifeeder pick-up; for factory use).	0~65535	

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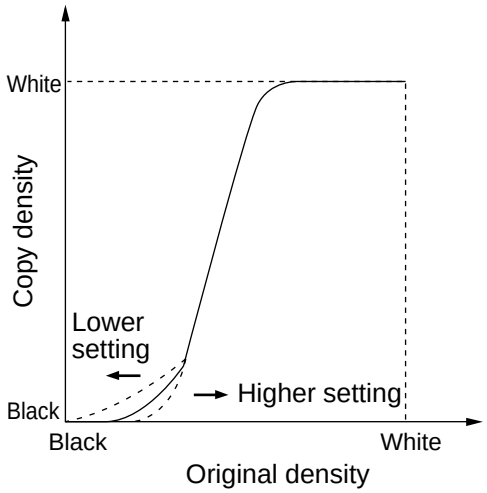
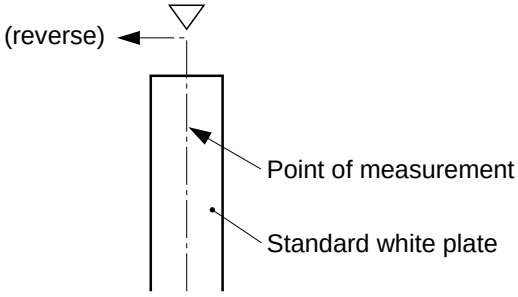
Item	Description	Settings	Remarks
DENS-ADJ	Use it to make adjustments if the copy image is foggy as a result of executing copy density auto correction. 	1~9	
ADJ-S	Use it to fine-adjust the point at which data for shading correction is measured on the standard white plate. • The adjustment is in units of 1/12 mm (about 0.083 mm). • The presence of scratches on the standard white plate can cause noticeable white, vertical lines on copies. If such is the case, shift the point of measurement in ADJ-S. 	50~80	
LASER-OFF	Use it to adjust the laser OFF timing (trailing edge).	0~65535	
PWM 600 MIN PWM 600 MAX PWM 200 MIN PWM 200 MAX	Use it to enter laser basic values. Label on the image processor PCB P6L xx —> Enter under 'PWM600MIN'. P6H xx —> Enter under 'PWM600MAX'. P2L xx —> Enter under 'PWM20MIN'. P2H xx —> Enter under 'PWM200MAX'.	0~65535	If you have initialized the RAM or replaced the image processor PCB, enter the value recorded on the label attached to the image processor PCB.

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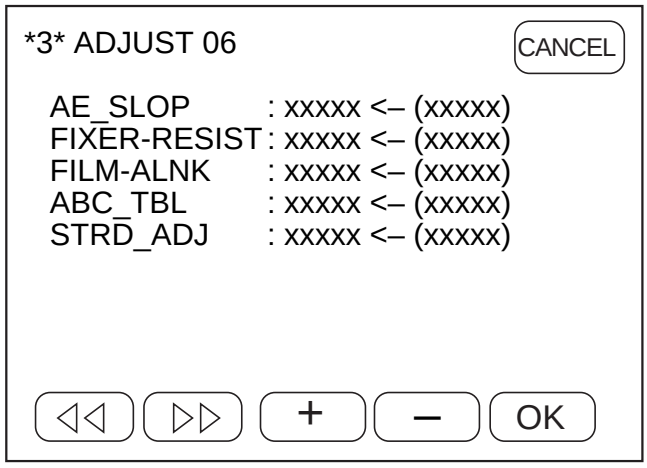
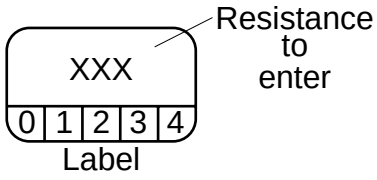
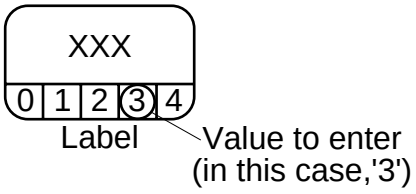
6. Adjusting the AE/Fixing Assembly Settings



Item	Description	Settings	Remarks
AE-SLOP	When copying in AE mode with priority on image quality, some types of originals generate light images. If such is the case, use this mode to adjust the copy image density.	1~19	Service handbook p.2-21.
FIXER-RESIST	Use it to enter the resistance of the fixing assembly. • If you have replaced the fixing assembly, enter the value recorded on the label attached to the fixing assembly. 		
FILM LANK	Use it to enter the film thickness rank (fixing temperature control value). • If you have replaced the fixing assembly, enter the value recorded on the label attached to the fixing assembly, thereby setting the fixing temperature control value. 	0~4	Enter a value higher than the recorded value by 1 to 2 if shiny lines (vertical) occur on solid black copies.

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Item	Description	Settings	Remarks
ABC_TBL	Use it to decrease the setting if the text density is too low (light image) when executing AE mode with priority on speed.	0~00009	Service handbook p. 2-20.
STRD_ADJ	Use it to adjust the scanner stop position in ADF-F1 stream reading mode. • Make adjustments if the copy image is too light in stream reading mode using the ADF-F1.	0~140	
AE_LIGHT	Use it to decrease the setting if the background of the original is too conspicuous when using AE mode with priority on image quality mode.	0~40	Service handbook p.2-21.
AE_DARK	Use it to increase the setting if the text density is too low (light image) when executing AE mode with priority on image quality.	0~40	Service handbook p.2-21.

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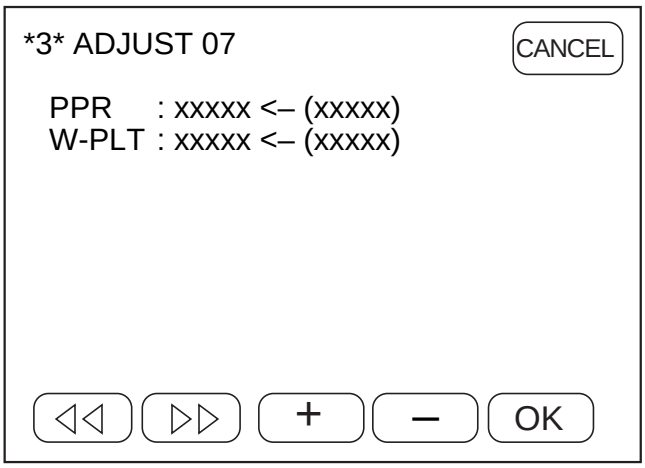
7. Shading Back-Up Data



Item	Description	Settings	Remarks
PPR	Indicates the standard white paper data (density data of the standard white paper).	0~65535	If you have initialized the RAM or replaced the image processor PCB, be sure to enter the value recorded on the service label.
W-LTP	Indicates the standard white plate data (density data of the standard white plate).	0~65535	

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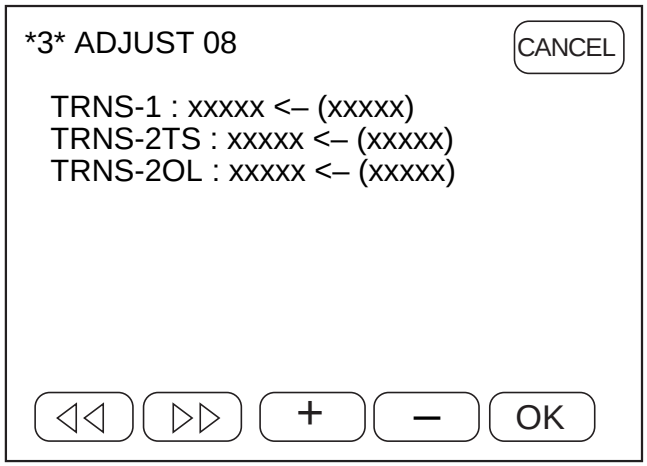
8. Adjusting the Transfer Charging Roller Bias



Item	Description	Settings	Remarks
TRNS-1	Use it to adjust the transfer roller bias occurring when copying on the 1st side.	0~10	Make adjustments if image faults occur because of an incorrect transfer roller bias. Guide • If fogging caused by stray toner occurs in the trailing edge margin, increase the value. • If the density grows higher (darker) at intervals of about 94 mm when copying an entirely halftone image, decrease the value.
TRNS-2TS	Use it to adjust the transfer roller bias occurring when copying on the 2nd side of a two-sided copy.	0~10	
TRNS-2OL	Use it to adjust the transfer roller bias occurring when copying on the 2nd side of an overlay copy.	0~10	

Note:
Settings are between 0 and 10; however, a value higher than 10 may be entered. (Any such number will be treated as ‘5’ for control.)

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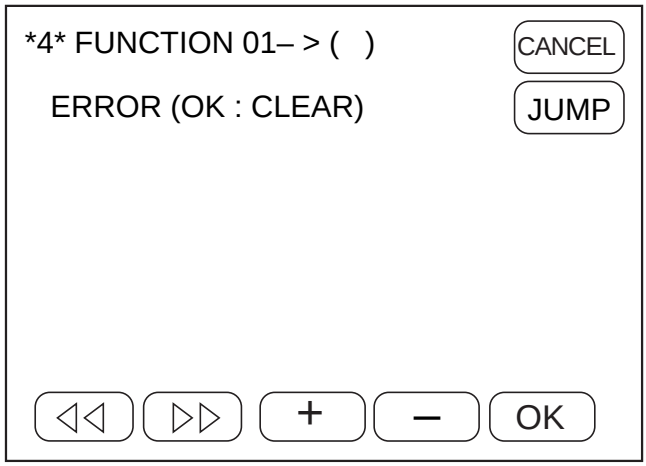
G. *4* FUNCTION (function mode)

- Use this mode to operate the machine under a specific set of settings or execute auto adjustment. (Check to make sure that the machine is in standby mode before executing any item.)
- Each press on the [▷▷] key brings up the next screen; each press on the [◁◁] key, on the other hand, brings up the previous screen.
- Press the item (notation) for operation or auto adjustment to highlight.
- Press the [OK] key to execute the selected item.
- Press the [CANCEL] key to return to the Menu screen.
- A press on the [JUMP] and a key on the keypad put the corresponding number into the parentheses '*4* FUNCTION1 –> ( )'; a press on the [JUMP] key then causes a leap to the corresponding page.

1. Clearing Errors



Item	Description	Reference page
Clearing E000, E001, E003, E004, E007-01, or E717	To clear an error indication, press 'ERROR' on the screen to highlight; then, press the OK key, and turn OFF/ON the main power switch.	

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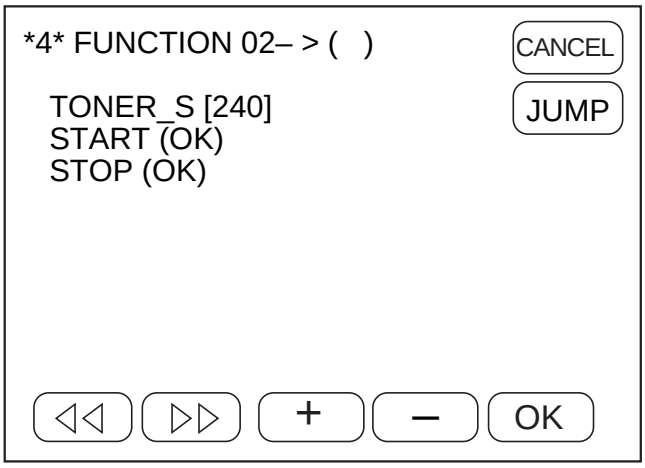
2. Stirring the Toner



Item	Description	Reference page
Stirring toner inside the developing assembly at installation	Press 'START' on the screen to highlight; then, press the OK key to start stirring the toner inside the developing assembly. At the same time, 'TONER_S' [240] (in sec) starts to increment; the operation stops at [0]. To stop in the middle, press 'STOP' to highlight, and press the OK key to stop.	

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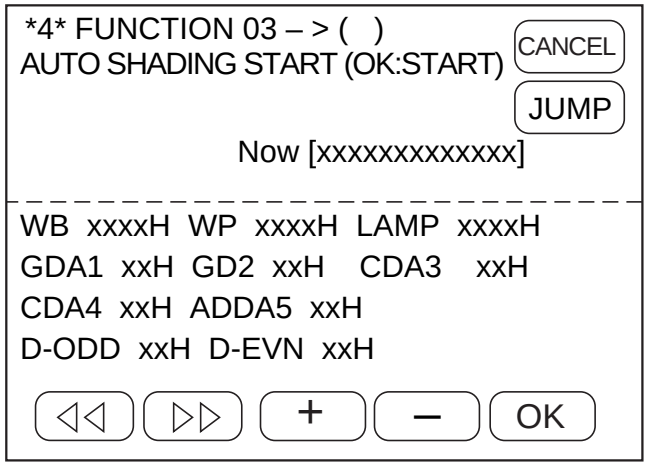
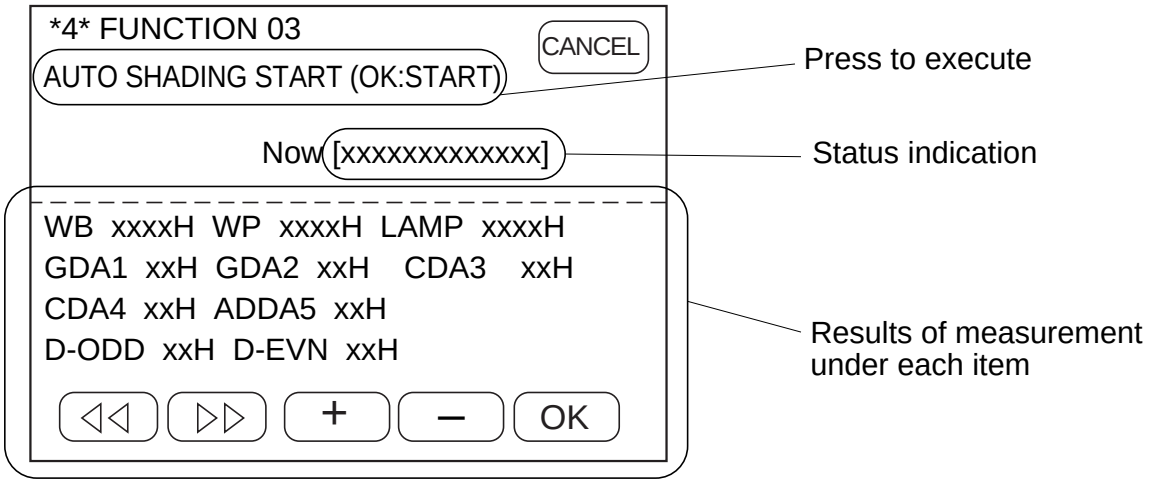
3. Shading Auto Correction



Item	Operation	Reference page
Shading auto correction (for servicing in the field)	1) Press 'AUTO SHADING START' on the screen to highlight; then, press the OK key. 2) The notation 'END' indicates the end of the operation.	

Guide to the Screen



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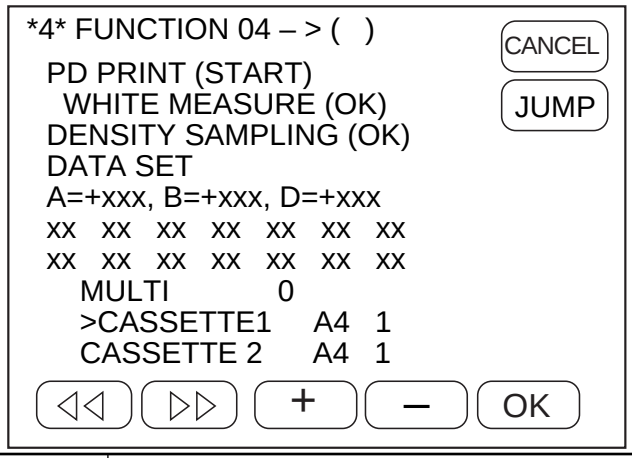
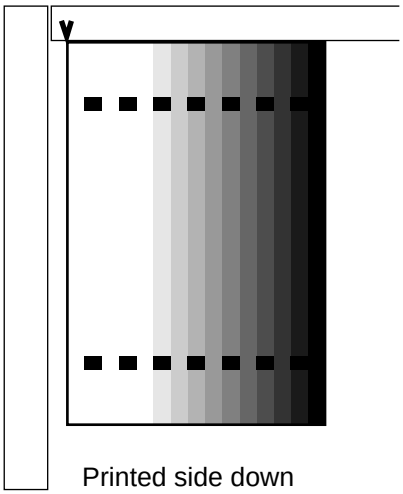
4. PD Density Auto Correction

- This mode must be executed in combination with 200PWM density auto correction and 600PWM density auto correction.



Item	Description	Reference page
PD density auto correction	1) Press 'PD PRINT' to highlight; then, press the Copy Start key. • A 15-gradation test pattern will be generated. 2) Place a blank sheet of paper (the whitest of all used by the user; no color copier paper allowed) on the copyboard glass; then, press 'WHITE MEASURE' to highlight, and press the OK key. • The scanner makes a single scan. 3) Replace the paper with the test pattern generated previously; then, press 'DESNITY MEASURE' to highlight, and press the OK key.  Printed side down 4) Check the values under A, B, and D: 20≤A≤50 –40≤B≤40 0≤D≤8 5) If the values are as indicated, press 'DAT SET' to highlight, and press the OK key.	Service handbook p.2-21

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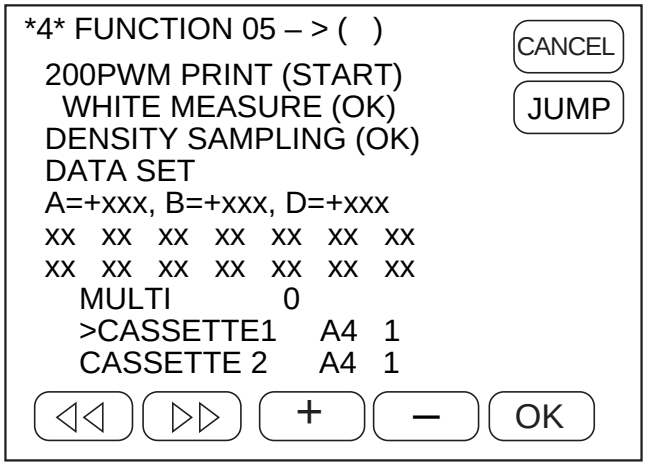
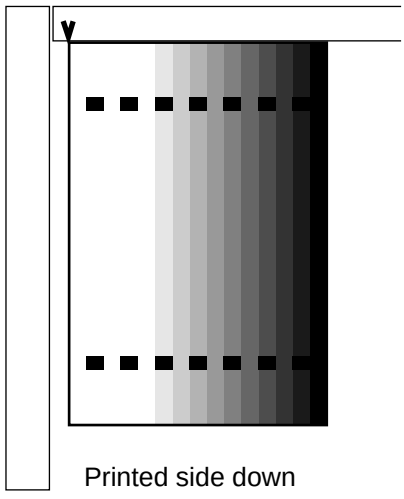
5. 200PWM Density Auto Correction

- You must execute this mode in combination with PD density auto correction and 600PWM density auto correction.



Item	Description	Reference page
200PWM density auto correction	1) Press '200PWM PRIT' to highlight, and press the Copy Start key. • A 15-gradation test pattern will be generated. 2) Place a black sheet of paper (whitest of all used by the user; no color copy paper allowed) on the copyboard glass; press 'WHITE MEASURE' to highlight, and press the OK key. • The scanner makes a single scan. 3) Replace the paper with the test pattern generated previously; press 'DENSITY MEAUSRE' to highlight, and press the OK key.  Printed side down 4) Check the value of A, B, and D. Insert 5) If the values are as indicated, press 'DATA SET' to highlight, and press the OK key.	Service handbook p.2-21.

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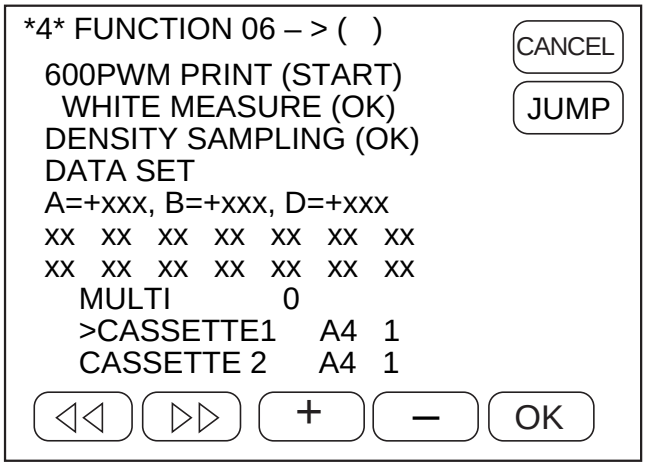
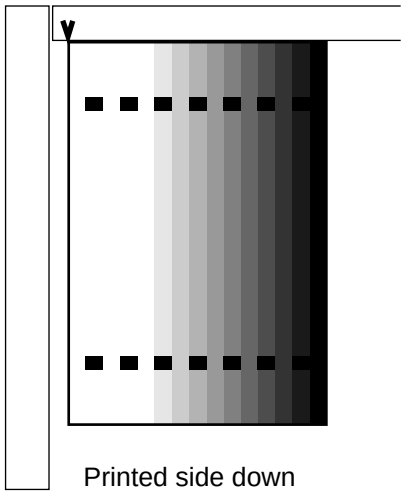
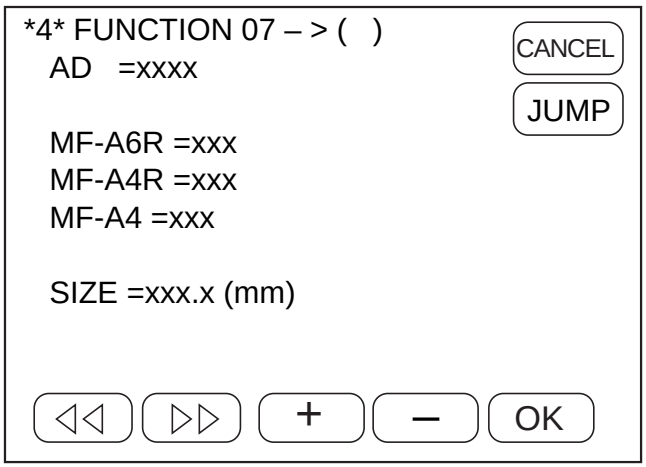
6. 600PWM Density Auto Correction

- This mode must be executed in combination with PD density auto correction and 200PWM density auto correction.



Item	Description	Reference page
600PWM density auto correction	1) Press '600PWM PRINT' to highlight, and press the Copy Start key. • A 15-gradation test pattern will be generated. 2) Place a blank sheet of paper (whitest of all used by the user; no color copy paper allowed) on the copyboard glass; press 'WHITE MEASURE' to highlight, and press the OK key. • The scanner makes a single scan. 3) Replace the paper with the test pattern generated previously; press 'DENSITY MEASURE' to highlight, and press the OK key.  Printed side down 4) Check the value of A, B, and D. Insert 5) If the values are as indicated, press 'DATA SET' to highlight, and press the OK key.	

7. Registering the Multifeeder Paper Width



Item	Description	Reference page
Multifeeder paper width basic value registration	1) Place an A6R sheet* in the multifeeder, and adjust the side guide to A6R. *A6 is what you obtain folding A4 into four, with its width being 105 mm. 2) Check the screen to make sure that the VR output is indicated under 'AD=xxx' as soon as the side guide is adjusted to A6R. Then, press 'MF-A6R' to highlight, and press the OK key. • The value will be stored under 'MF-A6R'. 3) Likewise, place and A4R sheet in the multifeeder, and adjust the side guide to A4R. 4) Check to make sure that the AD value has been indicated; then, press 'A4R' to highlight, and press the OK key. • The value will be stored under 'A4R'. 5) Then, place an A4 sheet of paper in the multifeeder, and adjust the side guide to A4. 6) Check to make sure that the AD value has been indicated; then, press 'A4;' to highlight, and press the OK key. • The value will be stored under 'A4'. 7) Press the Reset key twice to end service mode. 8) Turn off and then on the main power switch.	See P.2-15

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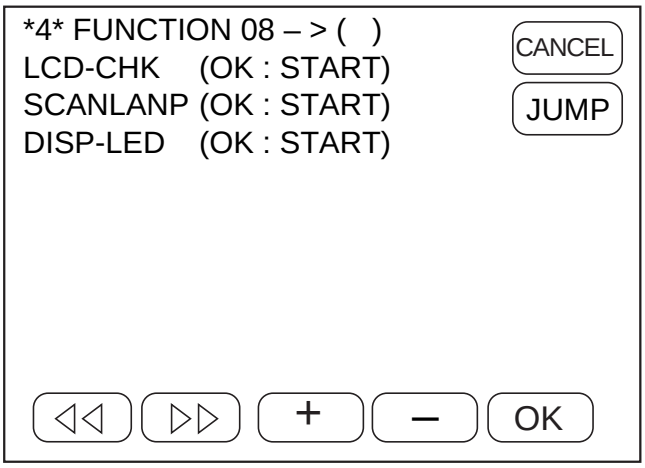
8. Checking the Control Panel Indications



Item	Description	Reference page
LCD-CHK • checking for missing dots on LCD	1) Press 'LCD-CHK' to highlight. 2) Press the OK key. • The entire face of the LCD reverses (white video; keys and notations disappear). 3) Press the area where the OK key was shown. • The entire face of the LCD reverses (black video). 4) Press the area where the OK key was shown. • The LCD will return to normal state.	
SCAN_LAMP • checking activation of scanning lamp	1) Press 'SCAN_LAM' to highlight. 2) Press the OK key. • The scanning lamp will turn on. 3) Press the OK key. • The scanning lamp will turn off.	
DISP-LED • checking control panel LEDs	1) Press 'DISP-ED' to highlight. 2) Press the OK key. • The LEDs on the control panel will turn on. 3) Press the OK key. • The LEDs on the control panel will turn off.	

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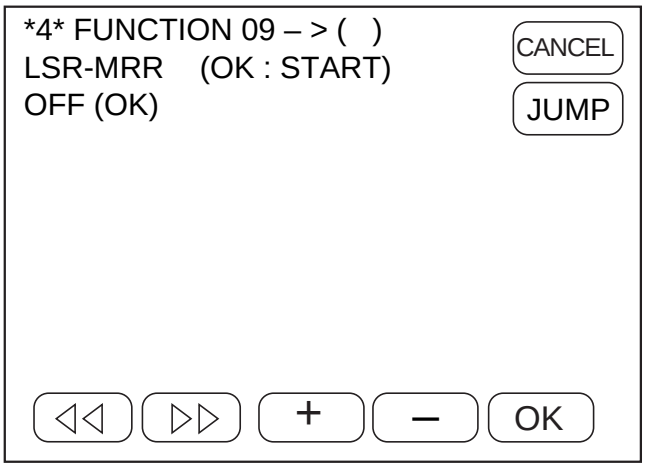
9. Laser



Item	Description	Reference page
LSR-MRR • checking laser scanner motor operation OFF • stopping operation	1) Press 'LSR-MMR' to highlight; then, press the OK key. • The laser scanner motor will start to rotate. 2) Press 'OFF' to highlight; then, press the OK key to stop the laser scanner motor.	See p.2-15

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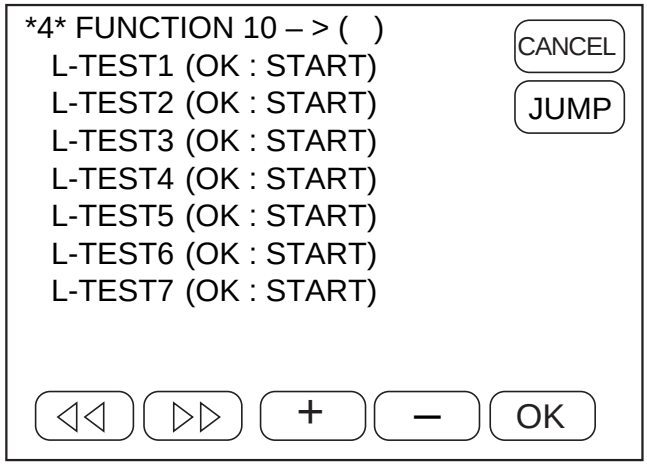
10. Test Print



Item	Description	Reference page
Test print output	Select the desired test print (press the item to high-light); then, press the OK key. L-TEST1: solid black test print L-TEST2: halftone test print L-TEST3: blank test print L-TEST4: 17-gradation test print L-TEST5: grid test print L-TEST6: vertical line test print L-TEST7: horizontal line test print	

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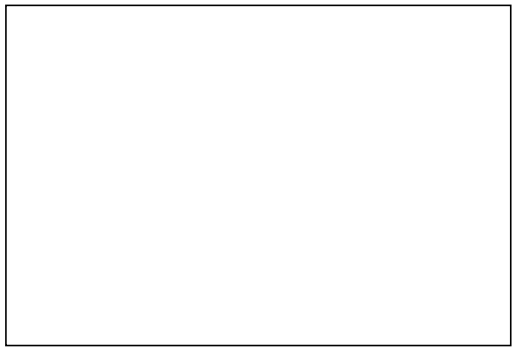
① **L-TEST1: solid black test print**

- Use it to check white spots or white lines.
- If white spots are noted, suspect dirt on the transfer charging roller or the separation static eliminator.
- If white lines are noted, suspect shading faults because of dirt on the standard white plate.

② **L-TEST2: halftone test print**

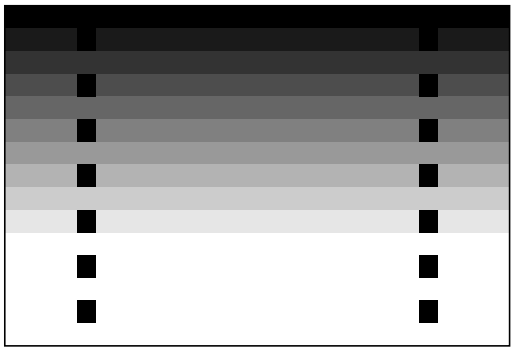
- Use it to check for transfer faults, black lines, white lines, or uneven intervals.
- If transfer faults are noted (vertical white spots), suspect dirt on the transfer charging roller or the separation static eliminator.
- If black lines are noted, suspect scratches on the drum or dirt on the primary charging roller.

③ **L-TEST3: blank test print**



- Use it to check for fogging.
- If fogging is noted, suspect a fault in the photosensitive drum, developing system, or laser system.

④ **17-gradation test print**



- Use it to check gradation and check for fogging, white lines, and uneven (left/right) density.
- If gradation is not good, suspect a fault in the laser system.
- If fogging is noted, suspect a fault in the photosensitive drum, developing assembly, or laser system.
- If white bands are noted, suspect a fault in the developing system or dirt on the transfer charging roller.
  If white lines are noted, suspect a shading fault because of dirt on the standard white plate.
- If uneven density (left/right) is noted, suspect dirt on the primary charging roller or a fault in the developing system.

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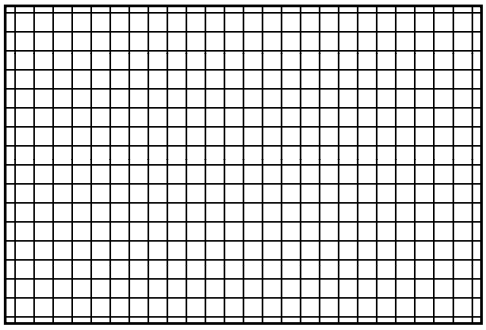
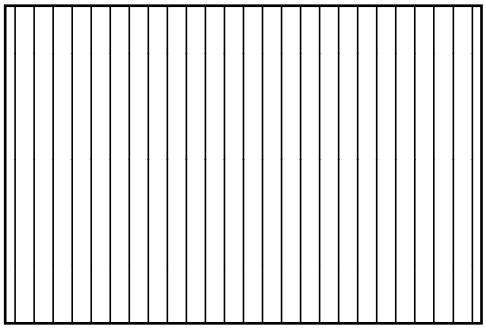
⑤ **L-TEST5: grid test print**



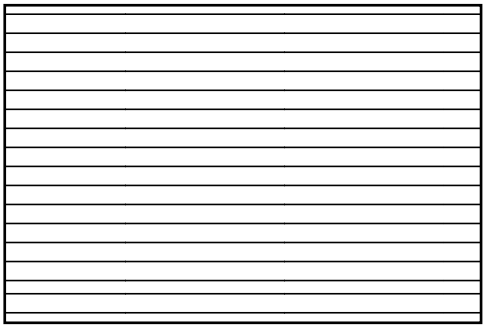
- Use it to check straight line and angles.
- If a discrepancy is noted, suspect a displaced laser beam or a fault in beam detection.

⑥ **L-TEST6: vertical line test print**



- Use it to check straight lines.
- If a discrepancy is noted, suspect a displaced laser beam or a fault in beam detection.

⑦ **L-TST7: horizontal line test print**



- Use it to check straight lines.
- If a discrepancy is noted, suspect a displaced laser beam or a fault in beam detection.

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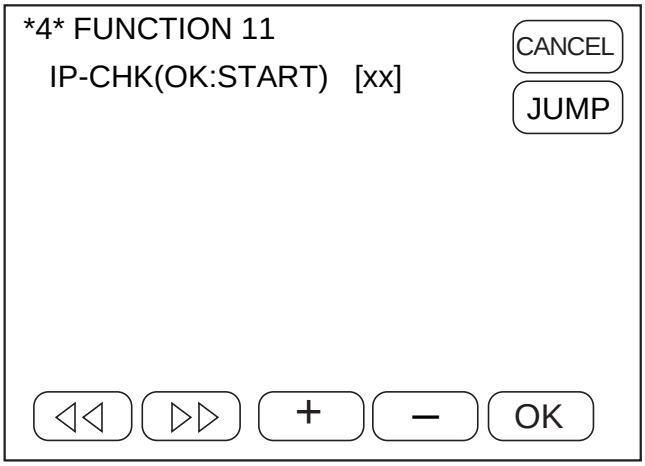
11. Checking the Image Processor PCB



Item	Description	Reference page
Image processor PCB self check	1) Press 'IP-CHK' to highlight. 2) Press the OK key to start a check on the image processor PCB. • 'OK' or 'NG' will be indicated; if 'NG', replace the image processor PCB.	

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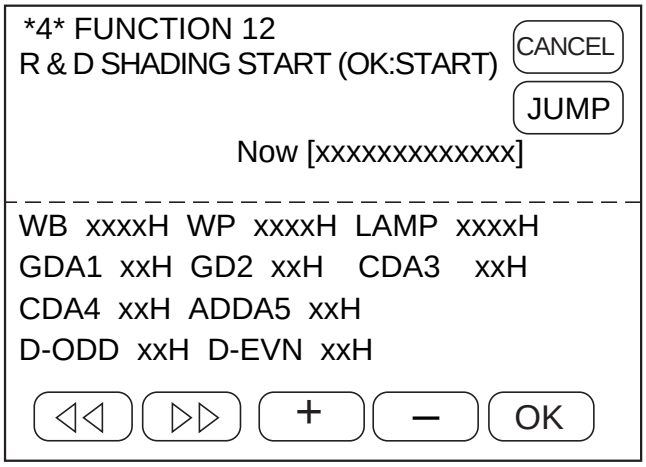
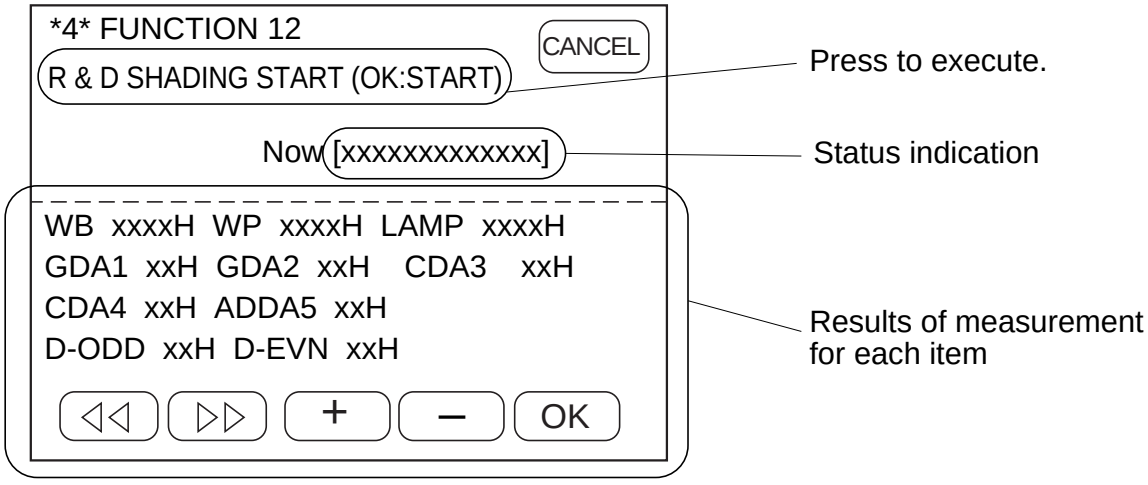
12. Shading Adjustment (for R&D/factory)

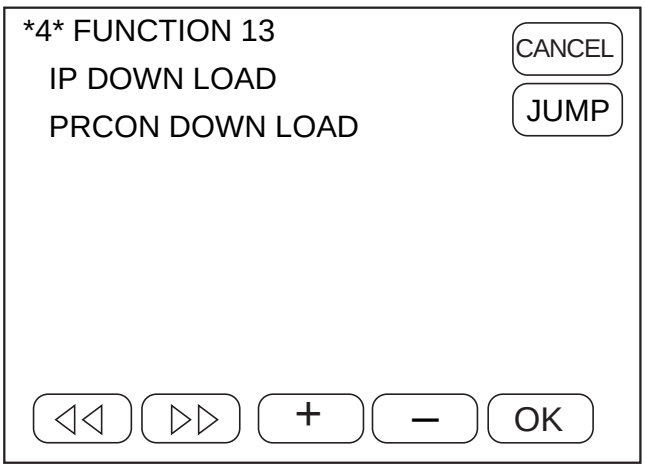


Item	Description	Reference page
R&D/factory shading auto correction	1) Place the standard white paper on the copyboard glass. 2) Press 'AUTO SHADING START' on the screen to highlight; then, press the OK key. 3) When a beep is sounded, press the OK key. ('LAMP LEVEL' will be indicated on the screen while the lamp is being adjusted.) If no beep is heard, turn VR1 on the DC controller PCB so that a beep will be heard; then, press the OK key. 4) End the operation when 'END' appears on the screen.	Service handbook p.2-21.

Guide to the Screen



13. Downloading Mode (updating FLASH ROM)



Item	Description	Reference page
FLASH ROM updating mode IP DOWNLOAD: • for updating FALSH ROM on image processor PCB PRCON DOWNLOAD: • for updating FLASH ROM on protocol controller	1) Perform the following in advance: ① Turn off the main power switch. ② Open the front door, and remove the connector cover for servicing; then, connect the copier to a PC with an RS232C cable. ③ Insert the handle of the static eliminator cleaning brush into the fixing assembly releasing assembly; then, turn on the main power switch. ④ Press the service switch, and press the * key twice; select 'FUCNTION '(*4*) so that the Downloading screen will appear. 2) Press 'IP DOWNLOAD' or 'PRCON DOWNLOAD' to highlight; then, press the OK key. • The power will automatically be removed and then will be supplied. • The following screen will appear to indicate that the system is ready to accept downloading: IP FDIMM download program 3) Operate according to the instructions on the PC screen.	

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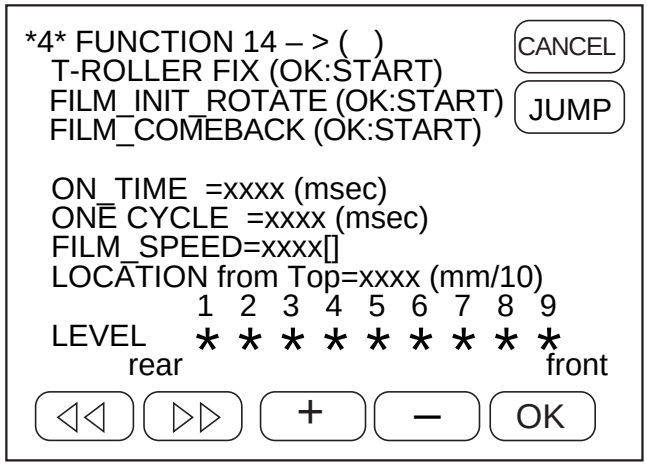
14. Adjusting the Fixing Film



Item	Description	Reference page
T-ROLLER FIX • fixing tension roller fixing mode (Use it to mechanically adjust the pressure of the fixing film drive roller.) Execute it as part of adjustment performed after replacing the film.	In this mode, the fixing film is rotated idly with the fixing tension roller being held in place after returning the film to an appropriate position (same as in FILMCOMEBACK). While the fixing film is rotated idly, the speed of displacement to the rear/front of the film is measured, and the result is indicated under ‘ FILM SPEED’ on the control panel.	
FILM_INIT_ROTATE • fixing film initial rotation mode (Use it after replacement of the fixing film or the fixing assembly.)	In this mode, the fixing film will automatically stop at a specific position, indicating the position under ‘LOCATION from Top’ and ‘LEVEL’ as it rotates.	
FILM_COMEBACK • fixing film displacement recovery mode (Use it if ‘E007’ is indicted when the fixing film has become displaced for some reason.)	In this mode, the film is returned to its proper position. The operation ends when the film has returned to the proper position or after a specific period of time has passed. (The rough adjustment range is not reached in 30 sec; or, the fine-adjustment range is not reached in 60 sec.)	
ON-TIME	Indicates the period during which the fixing film sensor has been ON.	
ONE CYCLE	Indicates the time taken by the fixing film to make a complete rotation.	
FILM_SPEED	Indicates the measured film speed.	
LOCATION from TOP	Indicates the position of the rear end of the fixing film from the V-cut.	
LEVEL	Indicates the position of the fixing film (4 or 5 is optimum).	

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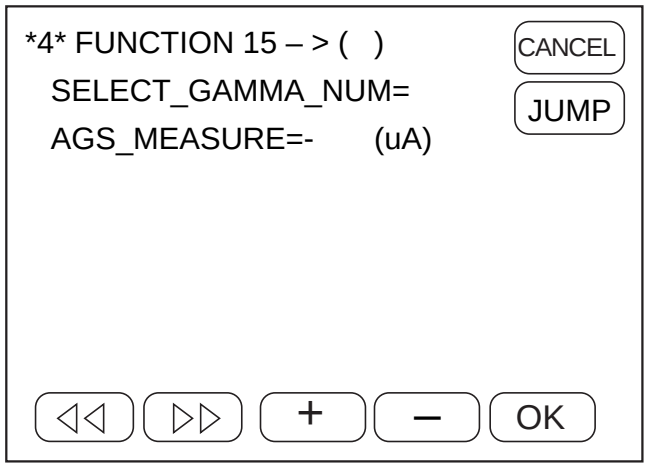
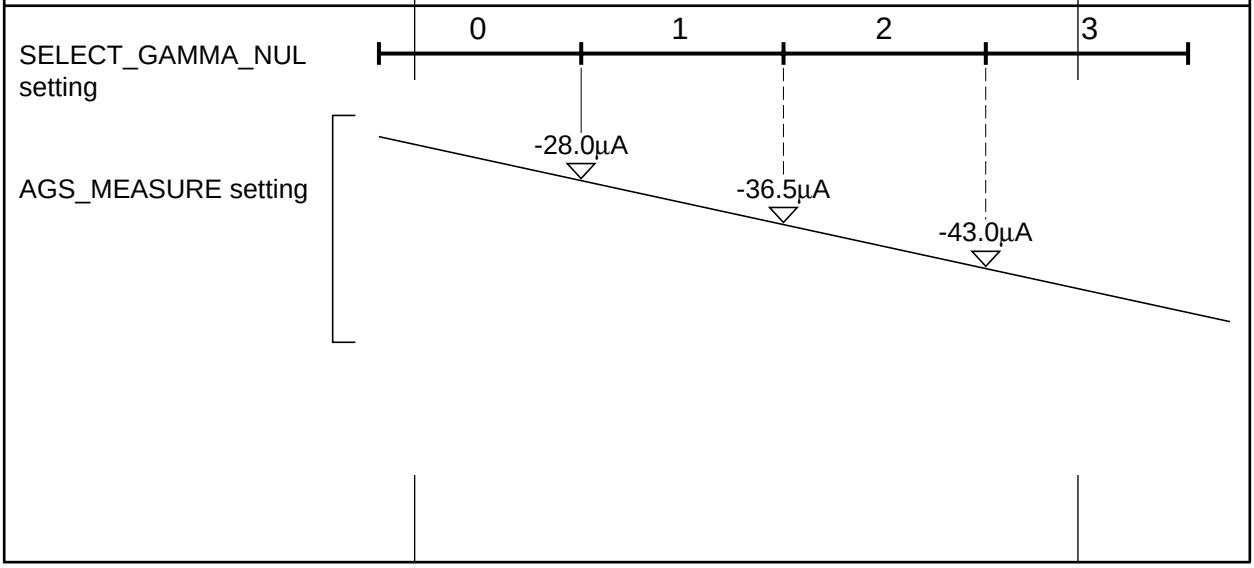
15. Measuring the Drum Resistance



Item	Description	Reference page
Photosensitive drum resistance measurement	1) Brig up the screen, and press the Copy Start key. • The resistance of the photosensitive drum will be measured, and the result will be indicated. • Execute this mode before changing 'AGSNON' of 'OPTION' in service mode (*5*) to '0' so that the measurement may be used as a reference. • For a guide, see the diagram below.	



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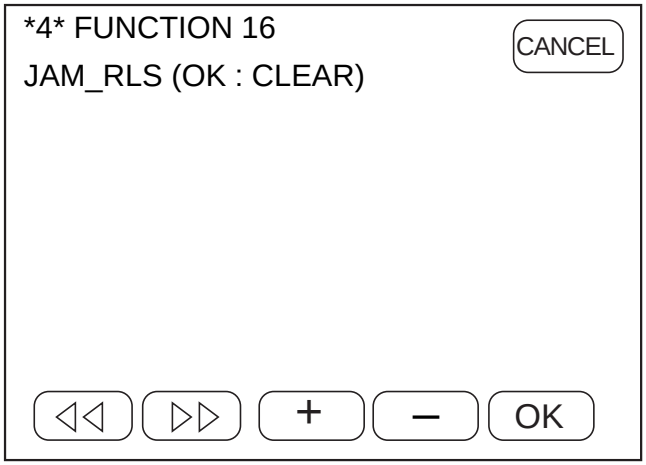
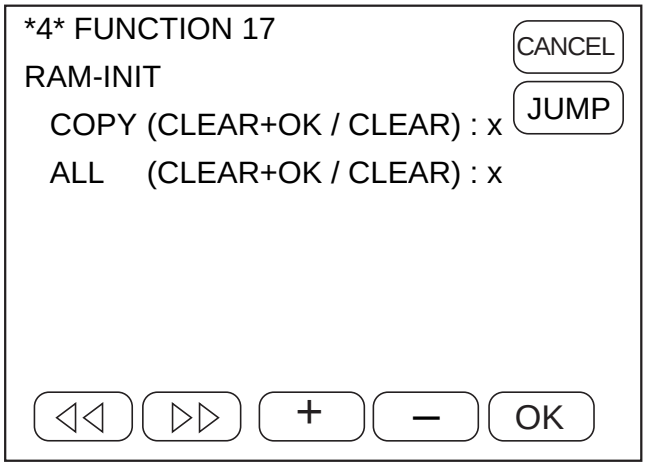
16. Resetting the Jam History



Item	Description	Reference page
Resetting jam history	Use this mode to collectively reset the jam histories shown under 'DISPLAY' in service mode (*1*). Press 'JAM_RLS' to highlight; then, press the OK key.	

17. Initializing the Memory (RAM)



Item	Description	Reference page
Initializing RAM	Press the appropriate item to highlight; then, press the Clear key, and press the OK key. COPY: Select it to initialize the data needed for the copier's service mode (*3*, *5*, *6*) and various copying modes to initial values. ALL: Select it to collectively initialize the above data. (Executing this item will initialize the back-up data of both fax and copier.)	

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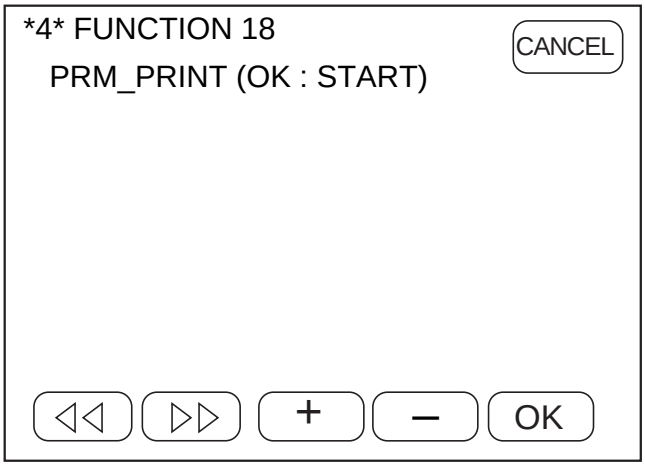
18. Printing the Parameters



Item	Description	Reference page
Use it to print out the contents of service mode *3*, *5*, and *6*; however, the machine must be installed with a FAX Board.	1) Press 'PRM_PRINT' to highlight; then, press the OK key. *3*: ADJUST *5*: OPTION *6*: COUNTER The machine must be equipped with fax functions.	

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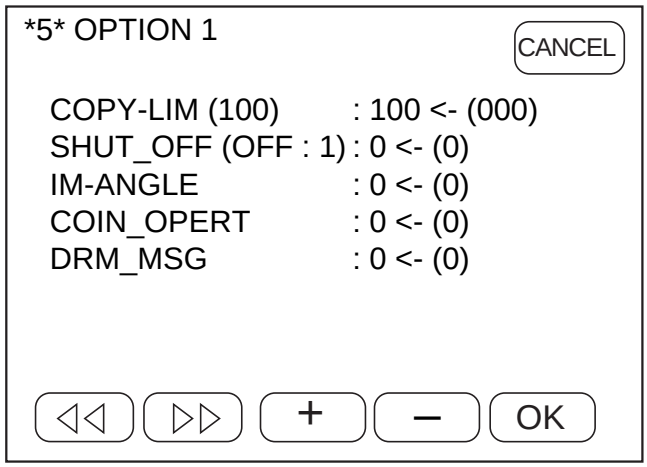
H. *5* OPTION (settings mode)

- Use this mode to set/change various machine settings (specifications).
- Each press on the [▷▷] key brings up the next screen; each press on the [◁◁] key, on the other hand, brings up the previous screen.
- Press the desired item (notation on the screen) to highlight.
- Use the keypad to enter numbers.
- A press on the [OK] key will permanently store the entered value.
- When done, be sure to turn off and then on the main power switch.

1. Setting the Copy Count and Shut-Off Slant Mode



Item	Function	Description
COPY-LIM	Use it to change the upper limit imposed on the copy count.	You may change the upper limit imposed on the copy count between 1 and 100 (copies).
SHUT_OFF	Use it to enable/disable the sleep function.	You may disable the auto shift function (time) to sleep state.
IM-ANGLE	Use it to switch slant mode.	Copies made in slant mode may become jagged; change the setting of this mode from '0' to '1' if such a problem is noted.
COIN_OPERT	Coinvender switching	Select '1' to support a coin vender.
DRM_MSG	Use this to switch the "Replace Drum" message.	0: Will not indicate the Replace Drum message on the control panel. (default in 230V model) 1: Will indicate the Replace Drum message. (default in 120V model)

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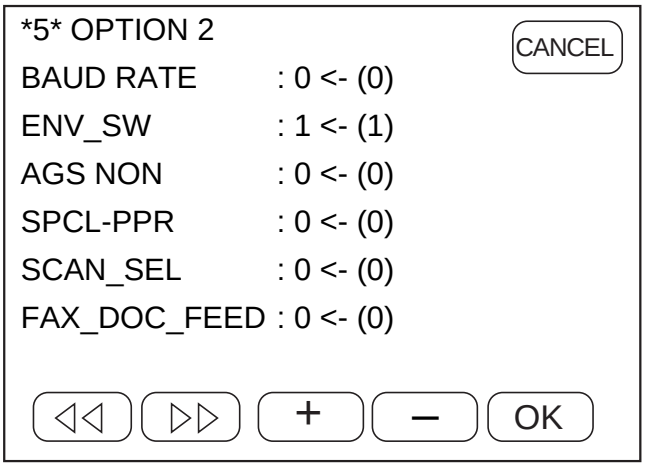
2. Switching the Baud Rate, Drum Resistance Measurements, and Thick Paper Mode



Item	Function	Description
BAUD RATE	Use it to change the communication speed of the RS232C interface for servicing.	0: 19200 baud 1: 9600 baud
ENV_SW	• Be sure to set it to '1' if you have selected a cassette exclusively for envelopes. The switch determines whether the machine should recognize an envelope cassette.	0: If the paper size dial of the cassette is set to the envelope index, the cassette will not be identified as an envelope cassette. 1: If the paper size dial of the cassette is set to the envelope index, the cassette will be identified as an envelope cassette. Default:1
AGS NON	Use it to specify whether the density correction curve should be modified based on the results of measuring the resistance of the photosensitive drum.	0: change the density correction curve based on the results of measuring the resistance of the photosensitive drum. 1: do not change the density correction curve. **Guide** If the results of making adjustments according to the Basic Image Adjustment Procedure are not good, execute the 15th screen (*4*). If the indicated value is far off the target value, set the item in this mode to '1' so normal images may be obtained. However, if such a problem occurs, you must suspect a fault in the image processor PCB, DC controller PCB, or composite power supply PCB.

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Item	Function	Description
SPCL-PPR	Use it to change thick paper mode.	0: The thick paper mode remains off. 1: Switching the fixing temperature, the thick paper mode is supported. 2: The fixing temperature is switched so that paper thicker than that supported under '1' may be supported. However, for '1' and '2' , the icon for the special cassette must be registered using 'ADDITIONAL FUNCTION' (i.e., the third icon from the middle row).
SCAN_SEL	Use it if parts of an image are missing in main scanning direction on large-size papers when using the feeder and copying a non-default original.	0: Nomal copying mode. 7: Priority on paper mode* *Center reference output prevents missing images.
FAX_DOC_FEED	use it to switch reading patterns for RDF-G1 fax originals.	0: The topmost page of the stack of originals will be picked up and read first and discharged on the right. 1: The bottommost page of the stack of originals will be picked up and read first and returned to the original tray (same way as copying).

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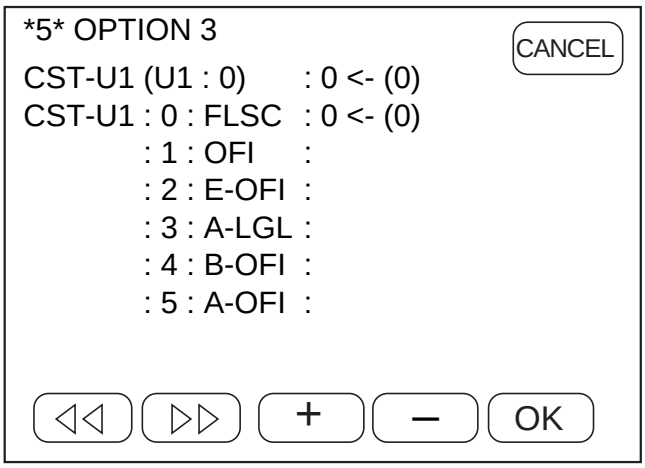
3. Setting the Mode of Notation for the U1 Cassette (universal 1 cassette)



Item	Function	Description
CST-U1	Use it to turn on and off the U-size cassette paper name.	0: If the paper size dial of the cassette is set to U1, 'U1' will be indicated on the LCD. 1: If the paper size dial of the cassette is set to U1, the abbreviation selected in the following item will be indicated on the LCD.
CST-U1: 0:FLSC 1:OFI 2:E-OFI 3:A-LGL 4:B-OFI 5:A-OFI	Use it to specify the U1-size cassette paper name (abbreviation).	If '1' is set for the previous item, one of the following may be selected for indication: 0: 'FLSC', standing for FOOLSCAP. 1: 'OFFI', standing for OFICIO. 2: 'OFI', standing for Ecuadorian OFICIO. 3: 'LGL', standing for Argentine LEGAL. 4: 'OFFI', standing for Bolivian OFICIO. 5: 'OFFI', standing for Argentine OFICIO.

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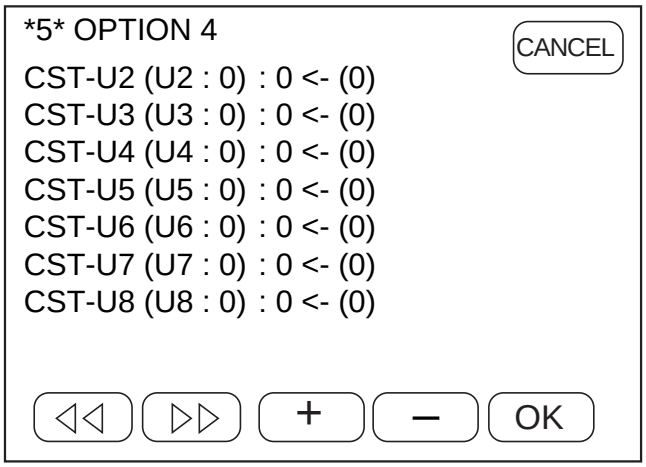
4. Setting the Mode of Notation for the U2 through U8 Cassettes (universal cassettes 2 through 8)



Item	Function	Description
CST-U2 CST-U3 CST-U4 CST-U5 CST-U6 CST-U7 CST-U8	Use it to turn on/off the U-size cassette name.	0: If the paper size dial of the cassette is set to U2 through U8, 'U1–U8' will be indicated on the LCD. 1: If the paper size dial of the cassette is set to U2 through U8, the following will be indicated: Paper Notation U2: FOLIO .....FOLIO U3: A-FLS.....FLS U4: G-LTR.....LTR U5: G-LTRR .....LTRR U6: G-LGL .....LGL U7: K-LGL.....LGL U8: K-LGLR .....LGLR

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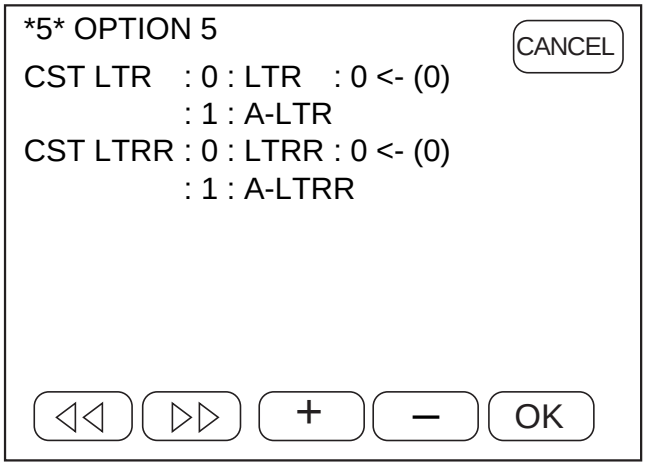
5. Setting the Mode of Notation for the LTR/LTRR Cassette



Item	Function	Description
CST-LTR	Use it to select the paper name notation for the LTR-size cassette.	0: If the paper size dial of the cassette is set to LTR, 'LTR' will be indicated on the LCD. 1: If the paper size dial of the cassette is set to LTR, 'LTR' will be indicated to stand for Argentine LETTER.
CST-LTRR	Use it to select the paper name notation for the LTRR-size cassette.	0: If the paper size dial of the cassette is set to LTR, 'LTRR' will be indicated on the LCD. 1: If the paper size dial of the cassette is set to LTRR, 'LTRR' will be indicated to stand for Argentine LETTER-R.

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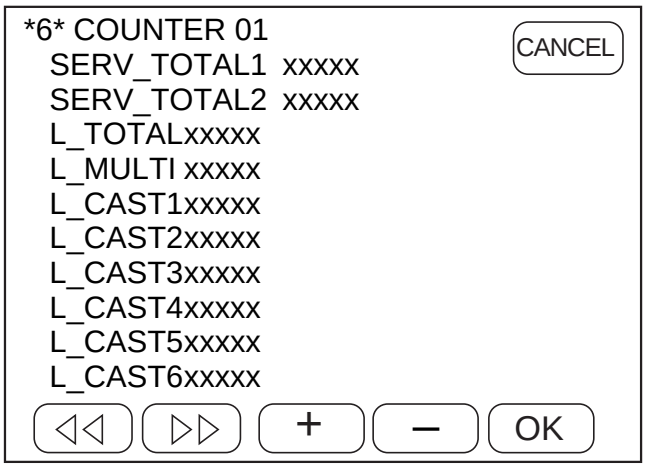
I. *6* COUNTER (counter mode)

- Use this mode to find out the numbers of specific operations the machine has performed.
- Each press on the [▷▷] key brings up the next screen; each press on the [◁◁] key, on the other hand, brings up the previous screen.
- A press on the [CANCEL] key will bring back the Menu screen.
- To clear the counter reading, press the item to highlight; then, press the [OK] key.
  When a dialog box appears asking you whether to clear the counter reading, press the OK key to reset the counter reading to '0'.



Indication	Description
SERV_TOTAL 1	Indicates the servicing total copy count 1.
SERV_TOTAL 2	Indicates the servicing total copy count 2.
L_TOTAL	Indicates the large-size copy/print count.
L_MULTI	Indicates the large-size copy count from the multifeeder.
L_CAST1	Indicates the large-size copy count from the cassette 1.
L_CAST2	Indicates the large-size copy count from the cassette 2.
L_CAST3	Indicates the large-size copy count from the cassette 3.
L_CAST4	Indicates the large-size copy count from the cassette 4.
L_CAST5	Indicates the large-size copy count from the cassette 5.
L_CAST6	Indicates the large-size copy count from the cassette 6.

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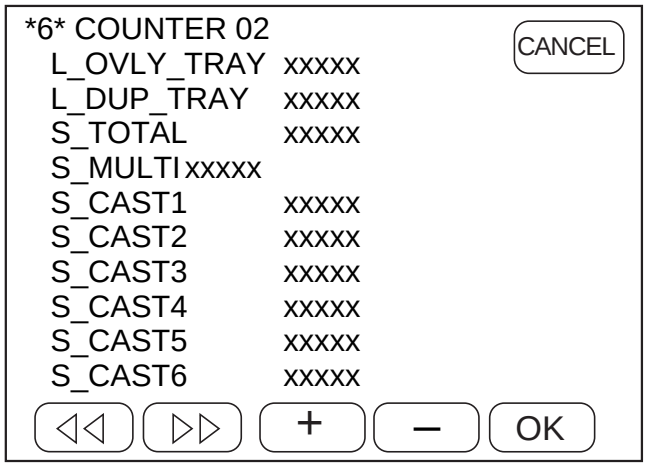

Indication	Description
L_OVLY_TRAY	Indicates the large-size overlay copy 2nd side pick-up count.
L_DUP_TRAY	Indicates the large size two-sided copy 2nd side pick-up count.
S_TOTAL	Indicates the small-size copy/print count.
S_MULTI	Indicates the small-size multifeeder pick-up count.
S_CAST1	Indicates the small size copy count from the cassette 1.
S_CAST2	Indicates the small-size copy counter from the cassette 2.
S_CAST3	Indicates the small-size copy counter from the cassette 3.
S_CAST4	Indicates the small-size copy counter from the cassette 4
S_CAST5	Indicates the small-size copy counter from the cassette 5.
S_CAST6	Indicates the small-size copy counter from the cassette 6.

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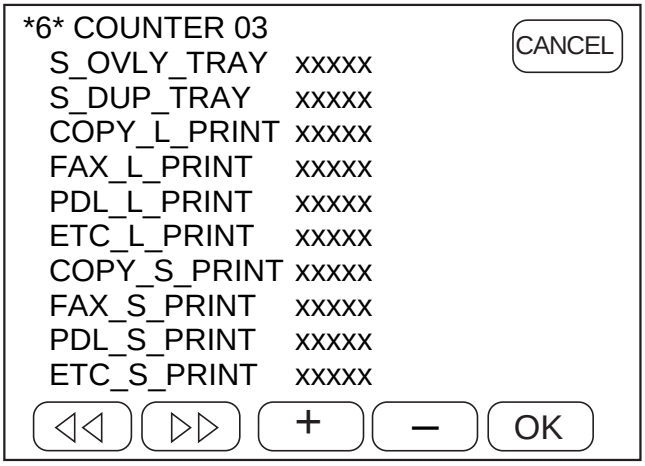

Indication	Description
S_OVLY_TRAY	Indicates the small-size overlay copy 2nd side count.
S_DUP_TRAY	Indicates the small-size two-sided 2nd side count.
COPY_L_PRINT	Indicates the large-size copy cont.
FAX_L_PRINT	Indicates the large-size fax print count.
PDL_L_PRINT	Indicates the large-size printer print count.
ETC_L_PRINT	Indicates the large-size print count by other system.
COPY_S_PRINT	Indicates the small-size copy count.
FAX_S_PRINT	Indicates the small-size copy count.
PDL_S_PRINT	Indicates the small-size printer print count.
ETC_S_PRINT	Indicates the small-size print count by other system.

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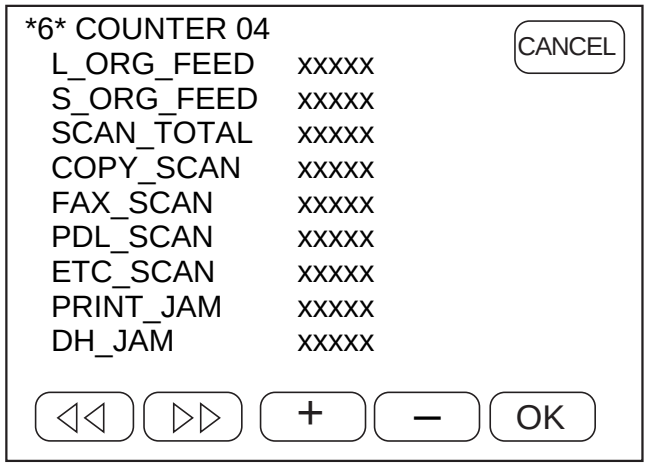

Indication	Description
L_ORG_FEED	Indicates the large-size original pick-up count.
S_ORG_FEED	Indicates the small-size original pick-up count.
SCAN_TOTAL	Indicates the total scan count.
COPY_SCAN	Indicates the scan count for copier mode.
FAX_SCAN	Indicates the scan count for fax mode.
PDL_SCAN	Indicates the scan count for printer mode.
ETC_SCAN	Indicates the scan count for other system.
PRINT_JAM	Indicates the print jam count.
DH_JAM	Indicates the feeder jam count.

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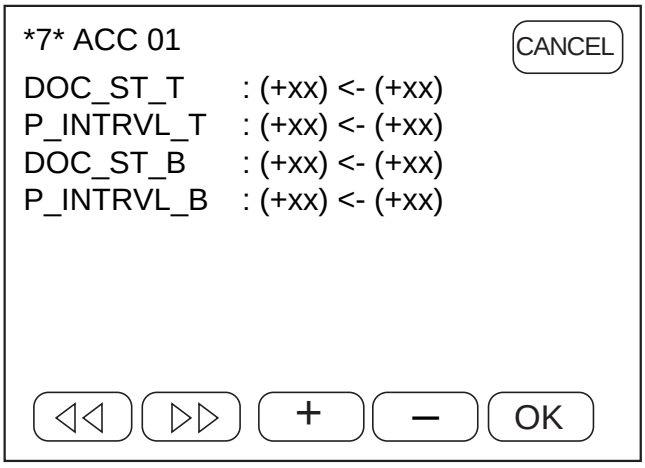
J. *7* ACC (accessory mode)

- Use this mode to adjust/operate options.
- Each press on the [▷▷] key brings up the next screen; each press on the [◁◁] key, on the other hand, brings up the previous screen.
- Press the item to adjust/operate to that it becomes highlighted.
- Use the keypad to enter numerals.
- A press on the [OK] key will permanently store the value.
- After operation, turn off and then on the rear main power switch.

1. Adjusting the Original Stop Position for the RDF

- This screen is effective only when an RDF is installed.



Item	Function	Description
DOC_ST_T	Use it to adjust the original stop position for upper separation pick-up.	
P_INTRVL_T	Use it to adjust the original stop position for upper separation pick-up in 2-on-1 mode.	
DOC_ST_B	Use it to adjust the original stop position for lower separation pick-up.	
P_INTRVL_B	Use it to adjust the original stop position for lower separation pick-up in 2-on-1 mode.	

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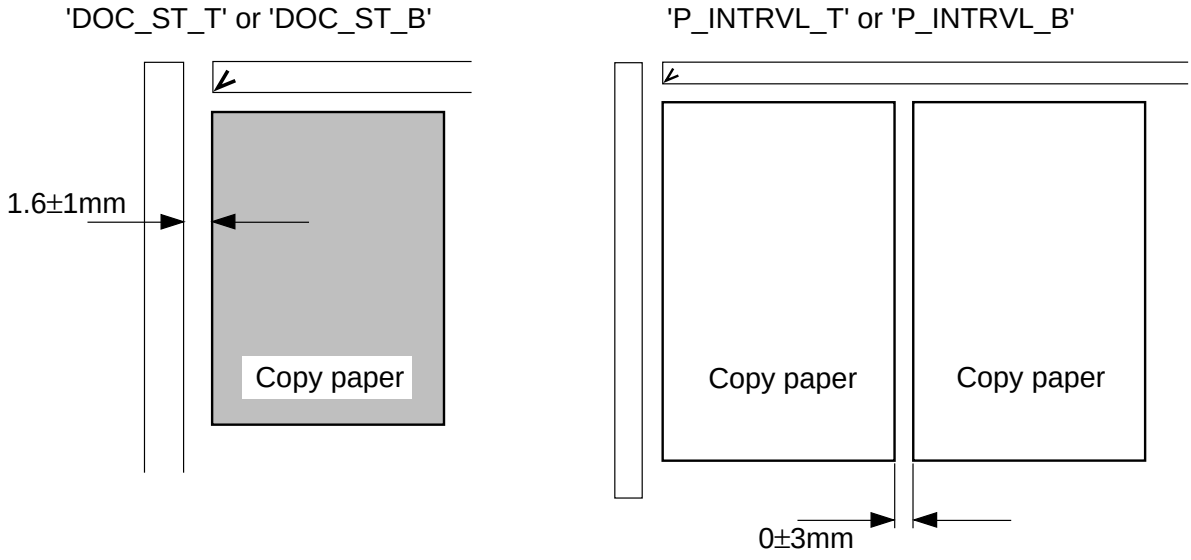
When this mode is selected, the sheets set on the RF's original tray will be picked up and stopped on the copyboard glass. Check how they are stopped, and make adjustments so that they are stopped correctly.

■ **Making Adjustments**

1) Start service mode.
2) Select the appropriate item.
   - Press the appropriate item to highlight.
3) Place copy paper on the RF's original tray as follows:
   - In the case of 'DOC_ST_T' or 'DOC_ST_B, place one A3 sheet of copy paper.
   - In the case of 'P_INTRVL_T' or 'P_INTRVL_B', place two A4 sheets of copy paper.
4) Enter a setting on the keypad.
   - In the case of 'DOC_ST_T' or 'DOC_ST_B',
     A higher setting will result in a shift to the trailing edge.
     A lower setting will result in a shift to the leading edge.
   - In the case of 'P_INTRVL_T' or 'P_INTRVL_B',
     A higher setting will increase the sheet-to-sheet distance.
     A lower setting will decrease the sheet-to-sheet distance.
5) Press the OK key.
   - The sheet on the original tray will be picked up and stopped on the copyboard glass.
6) Open the RF slowly, and check where the paper has been stopped.Thereafter, close the RF without removing the paper. (See below for standards.)



7) Press the OK key.
   - The sheet on the copyboard glass will be discharged to the RF's original tray. (However, in the case of 'DOC-STP-T' and 'P_INTRVL_T', the sheet will be discharged to the RF's original delivery tray.)
8) To end the work, press the Reset key twice to leave service mode.

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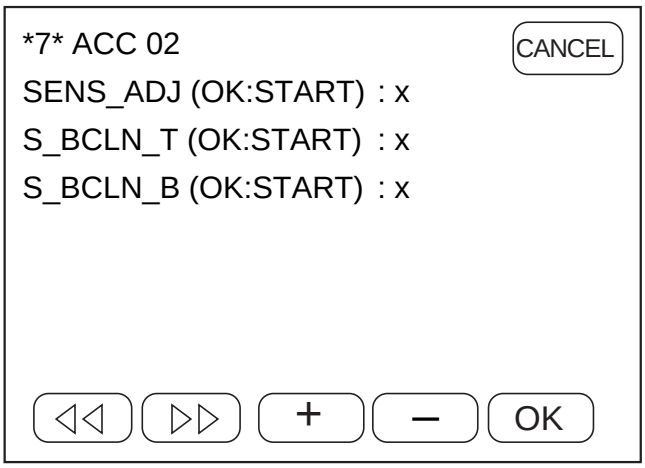
2. Adjusting the RDF Sensor/Cleaning the Belt

- This screen is effective only when an RDF is installed.



Item	Function	Description
SENS_ADJ	Use it to execute auto sensitivity adjustment for the RDF sensor. • Original sensor (S1) • Registration sensor (S3)	1) Press 'SENS_SDJ' to highlight. 2) Without any original on the RF's original tray, press the OK key. • '1' will appear under 'SENS_ADJ', indicating taht automatic adjustment is being executed. • If '1' remains for 30 sec or more, suspect a fault in the original tray sensor (S1), registration sensor (S3), or RF controller. 3) If '0' appears under 'SENS_ADJ', indicating that the adjustment is over, press the Reset key twice to leave service mode. (The foregoing adjustment is the same as using SW3 on the RF controller PCB.)
S_BCLN_T	Use it to execute cleaning of the separation belt for upper separation.	1) Press the appropriate item ('S_BCLN_T' or 'S_BCLN_B') to highlight. 2) Set a sheet of copy paper whose center has been moistened with alcohol on the RDF's tray. 3) Press the OK key. • The sheet of copy paper will be picked up and the separation belt will be rotated idly. 4) Press the OK key to end the operation. 5) Open the RF's top cover, and remove the sheet of copy paper. Then, close the RF's top cover. The foregoing adjustment is the same as using bit 6 of DIPS1 on the RF controller PCB.
S_BCLN_B	Use it to clean the separation belt for lower separation.	

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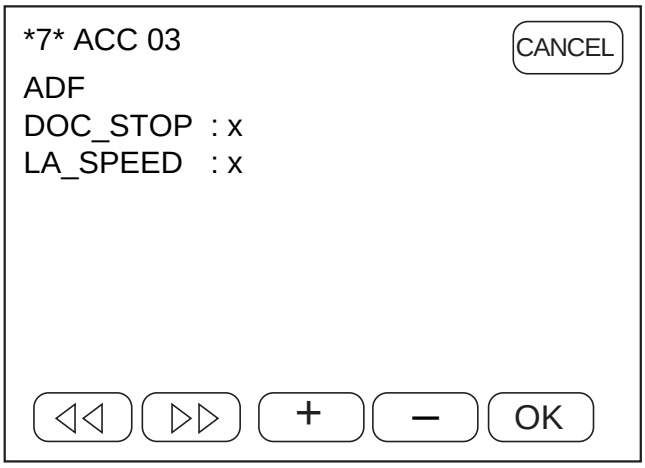
3. Adjusting the ADF

- This screen is effective only when an ADF is installed.



Item	Function	Description
DOC_STOP	Use it to adjust the original stop position for the ADF.	Compare copies made with an original on the copyboard glass and copies made using the ADF; use this item so that the leading edge registration is correct. (This is the same as adjusting the original leading edge registration using SW3 on the ADF controller PCB.) • A higher setting will increase the non-image width.
LA_SPEED	Use it to adjust the original feeding speed.	A higher setting increases the feeding speed, contracting the image in feeding direction. A lower setting decreases the feeding speed, extending the image in feeding direction.

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K. Electrical System

1 When Replacing major Parts

Item	Service mode	Steps
Before replacing the image processor PCB	*4* PRM_PRNT (effective only if equipped with fax function)	1) Print out all registration data (one-touch dialing, speed dialing, user data list, etc.; effective only if equipped with fax functions). 2) If the machine is equipped with fax functions, execute 'PRM_PRNT' (*4*), and take notes of the settings in user mode and others. • Executing the mode will print out the settings/values under 'ADJUST' (*3*), 'OPTOIN' (*6*), and 'COUNTER' (*6*). If the machine is not equipped with fax functions, you cannot execute 'PRM_PRNT' (*4*).
After replacing the image processor PCB	*4* RAM Clear *3* (Enter the value recorded on the label.) • Service label attached to the front door • Label attached to the image processor PCB • Label attached to the copier power supply PCB *4* Shading auto correction *4* PD density auto correction *4* 200PWM density auto correction *4* 600PWM density auto correction	1) Replace the image processor PCB. 2) Execute 'RAM clear' in service mode (*4*). 3) Start service mode (*3*), and enter the value recorded on the service label. 4) Enter the values recorded on the image processor PCB under the appropriate item (*3*) as follows: • 600PWM MIN • 600PWM MAX • 200PWM MIN • 200PWM MAX 5) Execute 'shading auto correction' in service mode (*4*). 6) Execute 'PD density auto correction', '200PWM density auto correction', and '600PWM density auto correction' in service mode. 7) Enter settings/values under 'OPTION' (*5*) and in user mode.

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Part	Service mode	Steps
Composite power supply PCB	*3* (Enter the values recorded on the label.) *4* Shading auto correction *4* PD density auto correction *4* 200PWM density auto correction *4* 600PWM density auto correction	1) Enter the values recorded on the label attached to the composite power supply PCB under the appropriate items on the 3rd page in service mode (*3*). 2) Execute 'shading auto correction' in service mode (*4*). 3) Execute 'PD density auto correction' (*4*), '200PWM density auto correction', and '600PWM density auto correction'.
Laser scanner unit		
Laser unit		
CCD unit	*4* Shading auto correction	1) Execute 'shading auto correction' in service mode (*4*).
Analog processor PCB		
Scanning lamp	*4* Factory/R&D shading auto correction	1) Execute 'factory/R&D shading auto correction' in service mode (*4*).
DC controller PCB		
Standard white plate		
Fixing assembly	*3* FIXER-REGST *3* FILM LANK *4* FILM_INIT_ROTATE	1) Enter the values recorded on the label attached to the fixing assembly under 'FIXER-REGST' and ▷▷ in service mode (*3*). 2) Execute 'FILM_INIT_ROTATE' (14th page under 'FUCTION'; *4*).

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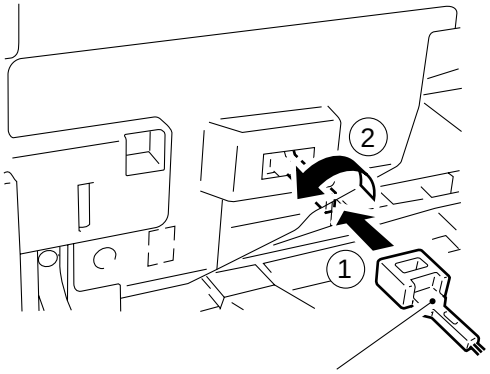
2 Shading Auto Correction

- There are two types of shading auto correction: for servicing and for factory/R&D. (3rd screen in *4*)
- In shading auto correction, various data items are measured, and the results are stored in RAM on the image processor PCB. (The stored data will be used as target value for shading correction executed before copying operation.)
- Use this mode for the following:
- When replacing the image processor PCB
- After executing 'RAM INIT' in service mode (*4*)
- Before executing 'copy auto density correction' in service mode (*4*)
- After replacing the composite power supply PCB
- After replacing the laser unit
- After replacing the CCD unit
- After replacing the analog processor PCB

■ **Work**

1) Open the front door, and insert the handle of the separation static eliminator cleaning brush into the fixing assembly releasing opening.



Separation static eliminator cleaning brush

Figure 3-1006

2) Insert the door switch actuator into the door switch assembly.
3) Push the service switch with a hex key.
   - '$' will be indicated in the upper left corner of the LCD.
4) Press the * key twice.
   - The Service Mode Menu screen will appear.

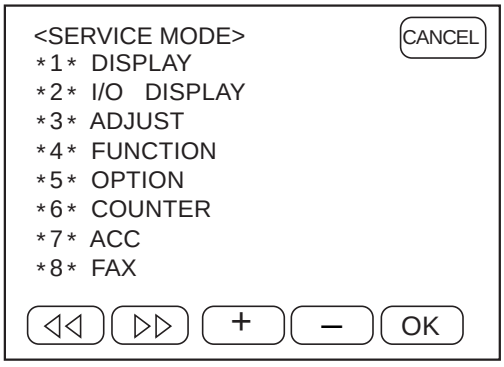


Figure 3-1007

5) Press 'FUCNTION' (*4*) on the Menu screen to highlight; then, press the OK key.
6) Press the Page key [▷▷] to bring up the Shading screen (3rd screen).

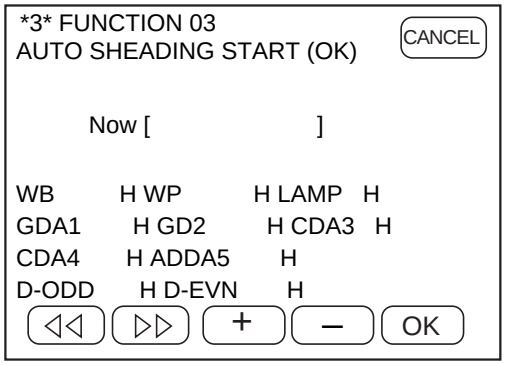


Figure 3-1008

7) Press 'AUTO SHADING' on the LCD to highlight; then, press the OK key.
   - 'shading auto correction' will be executed.
8) In a while, 'Now [END]' will appear on the screen to indicate the end of shading correction.

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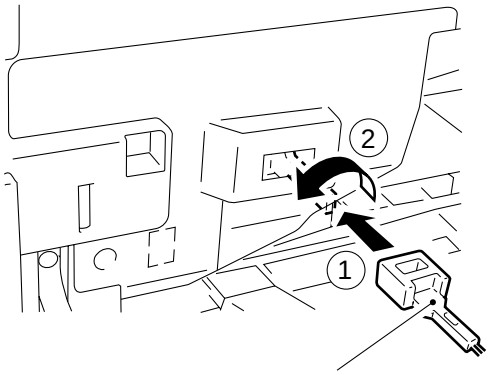
3 Copy Density Auto Correction

- There are three types of copy density auto correction: execute the three types as a single set. (You must have executed 'shading auto correction' before executing this mode.)
  ① PD density auto correction
  ② 200PWM density auto correction
  ③ 600PWM density auto correction
- This mode is executed to correct the following:
  ① Laser characteristics
  ② Developing bias
- Execute this mode for the following:
- When replacing the laser unit
- When replacing the copier power supply PCB
- When image faults occur
- When replacing the image processor PCB

■ Operation

1) Open the front door, and insert the handle of the separation static eliminator cleaning brush into the fixing assembly releasing opening.



Separation static eliminator cleaning brush

Figure 3-1009

2) Insert the door switch tool into the door switch actuator.
3) Press the service switch with a hex key.
   - '$' will appear in the upper left corner of the LCD.
4) Press the * key twice.
   - The Service Mode Menu screen will appear.

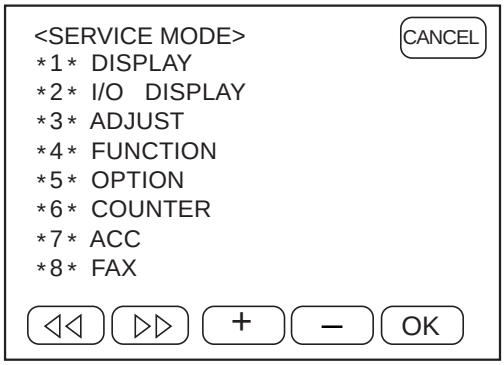


Figure 3-1010

5) Press 'FUCNTION' on the Menu screen (84*) to highlight; then, press the OK key.
6) Press the Page key [▷▷] to bring up the 3rd screen.
7) Execute 'shading auto correction'. (See the descriptions for 'shading auto correction'.)
8) At the end of 'shading auto correction', press the Reset key once.
9) With the feeder or the copyboard cover open, make two solid black copies.
10) Check to make sure that '$' is indicated in the upper left corner of the LCD, and press the * key once.
    - The Service Mode Menu screen will appear. (If '$' is not indicated, press the service switch, and press the * key twice.)
11) Press 'FUNCTION' (*4*) to highlight; then, press the OK key.
12) Press the Page key [▷▷] to bring up the PD Density Auto Correction screen (4th screen).

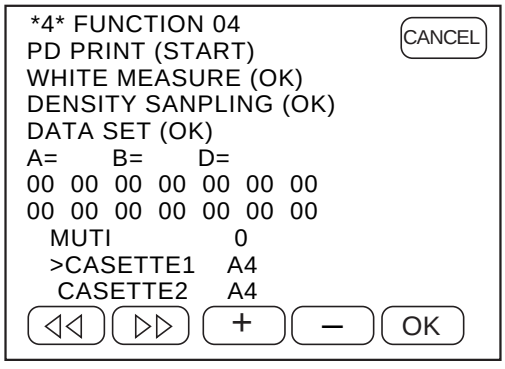


Figure 3-1011

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13) Select either 'MULTI', 'CASSETTE1', or 'CASSETTE2'.
(Press the appropriate item to select so that the cursor ( ) points to the item.)
14) Generate a PD pattern print. (Press 'PD PRINT' to highlight; then, press the Copy Start key.
• You will be using the pattern print later.
15) Place five to ten sheets of blank copy paper on the copy board, and close the feeder or the copyboard cover.

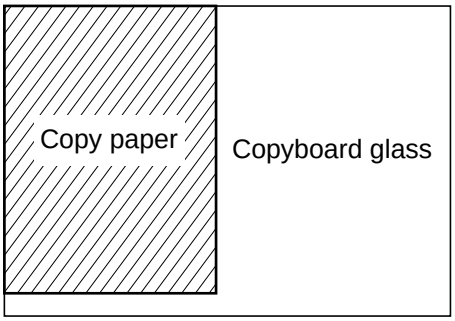

Figure 3-1012

16) Press 'WHIE MEASURE' on the screen to highlight, and press the OK key.
• The scanner will move forward to read the blank copy paper.
17) Remove the blank copy paper from the copyboard glass, and place the generated pattern print on the copyboard glass against the V marking at the rear left.
(You must place the pattern print correctly, or correct adjustment will not be possible.)

■ **Place the pattern print as shown**

When the pattern print is placed reversing (left/right) its orientation, the image becomes appreciably light.

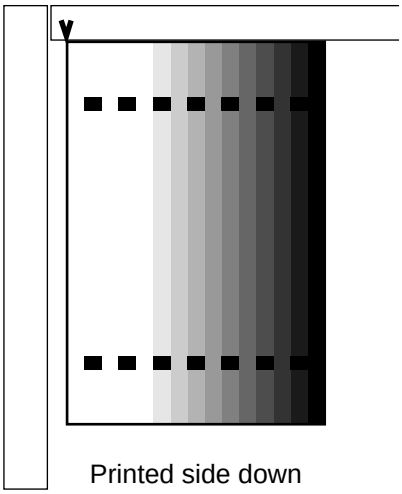

Figure 3-1013

18) Press 'DENSITY SAMPLING' to highlight; then, press the OK key.
• The scanner makes 13 scans.
19) At the end of the operation, check to make sure that the values under A, B, and D on the LCD are as follows.
If the values are not as shown, start over at step 7) since the adjustment may have been wrong.

Reference:

A, B, and D are approximate values so that optimum images may still be obtained even if the values are outside the range; you may omit "temporary remedy" as long as the images are optimum.

■ For PD and 200PWM
$20 \leq A \leq 50$
$-40 \leq B \leq 40$
$0 \leq D \leq 8$

■ For 600PWM
$20 \leq A \leq 60$
$-70 \leq B \leq 20$
$0 \leq D \leq 8$

20) Check the above, and press 'DATA SET' to highlight; then, press the OK key.
• This will set the values under A, B, and D which have been measured.
21) Press the Page key, and execute '200PWM density auto adjustment'.
(Follow the same steps starting with step 9) to execute the mode.)
22) When '200PWM density auto adjustment' is over, execute '600PWM density auto adjustment'.
(Follow the same steps starting with step 9) to execute the mode.)
23) Press the Reset key twice to end service mode.

If the values under A, B, and D are not as indicated after executing 'copy density auto correction' several times and, in addition, optimum images cannot be obtained, you may perform the following as a "temporary remedy":

The temporary remedy will enable normal copying; however, since the image quality will lower, be sure to correct any fault as soon as possible, and execute 'copy density auto correction' once again.

■ **Possible Faults**
- Drum unit
- Scanning lamp
- Laser unit
- Composite power supply PCB
- Analog processor PCB
- Image processor PCB

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4 Registering the Multifeeder Paper Width Basic Values

You must register the multifeeder paper width basic values whenever you have replaced the multifeeder paper width detecting VR.

1) Replace the paper width detecting VR.
2) Open the front door, and insert the handle of the separation static eliminator cleaning brush into the fixing assembly releasing assembly.
3) Insert the door switch actuator into the door switch assembly.
4) Press the service switch with a hex key.
5) Press the * key twice.
6) Press 'FUNCTION' on the screen (*4*) to highlight; then, press the OK key.
7) Press the Page key to bring up the Multifeeder Paper Width Basic Values Registration screen.

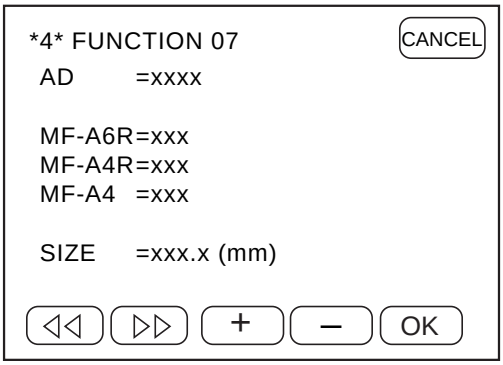

Figure 3-1014

8) Set A6 paper in the multifeeder, and adjust the side guide to A6R.

Note:
A6 is what is obtained by folding A4 paper into four; the width is 105 mm.

9) When the side guide is adjusted to A6R, the VR output value will be indicated under 'AD=xxx' on the screen.
   After checking the value, press 'MF-A6R' on the screen to highlight; then, press the OK key.
   • The value will be stored under 'MF-A6R'.
10) Likewise, set A4R paper in the multifeeder, and adjust the side guide to A4R.
11) Check that the value of 'AD' is indicated; then, press 'A4R' to highlight, and press the OK key.
   • The value will be registered under 'A4R'.
12) Set A4 paper in the multifeeder, and adjust the side guide to A4.
13) Check that the value of 'AD' is indicated; then, press 'A4' to highlight, and press the OK key.
   • The value will be stored under 'A4'.
14) Press the Reset key twice to end service mode.
15) Turn off and on the main power switch.

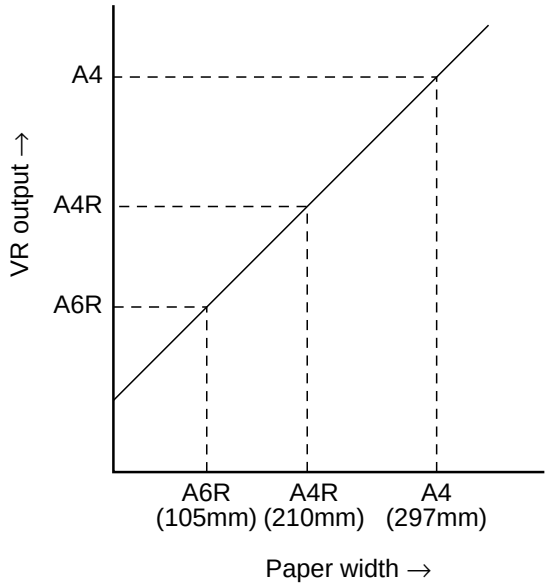

Figure 3-1015

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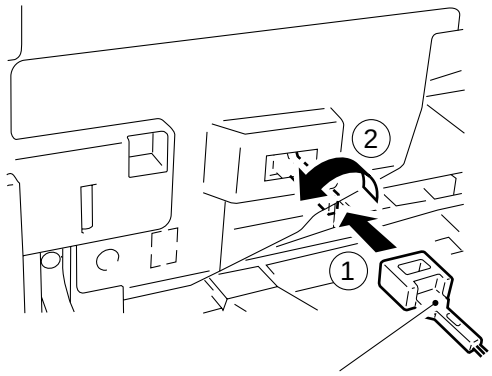
5 Shading Auto Correction

- There are two types of shading correction: for servicing and for R&D/factory. (Use the 3rd screen in *4*; do not use shading auto correction for R&D/factory.)
- In shading correction, various data items are measured, and the results are stored in RAM on the image processor PCB. (The data will be used as target values for shading correction executed before copying.)
- Execute the mode (R&D/factory) for the following:
- After replacing the standard white plate
- After replacing the scanning lamp
- After replacing the DC controller PCB

1) Open the front door, and insert the handle of the separation static cleaning brush into the fixing assembly releasing opening.



Separation static eliminator cleaning brush

Figure 3-1016

2) Insert the door switch actuator into the door switch assembly.
3) Press the service switch with a hex key.
   - '$' will be indicated in the upper left corner of the LCD.
4) Press the * key twice.
   - The Service Mode Menu screen will appear.

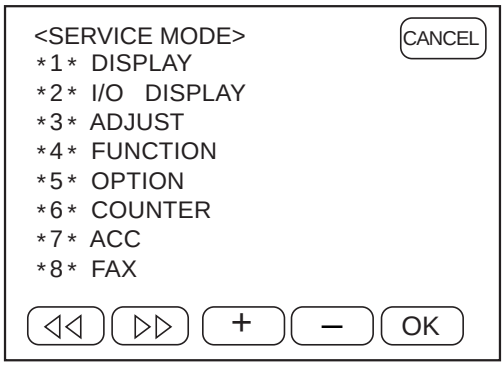


Figure 3-1017

5) Press 'FUNCTION' on the Menu screen (*4*), an press the OK key.
6) Press the Page key [▷▷] to bring up the Shading screen (12 the screen).

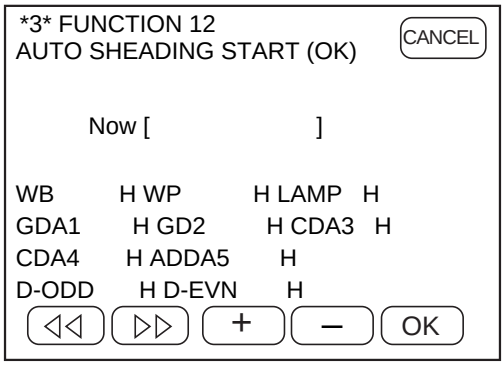


Figure 3-1018

7) Place five to ten standard blank sheets of paper (FY9-3004) on the copyboard glass.

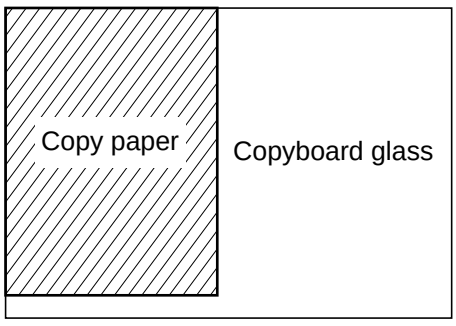


Figure 3-1019

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8) Press 'AUTO SHADING START' on the LCD to highlight; then, press the OK key.
   • 'shading auto correction' will be executed.
9) A beep will be sounded while the lamp is being adjusted (with the screen indicating 'LAMP LEVEL'); press the OK key when the beep stops.
   • If no beep is heard, remove the rear cover, and turn VR1 on the DC controller PCB until a beep is heard; then, press the OK key.
   If no beep is heard after turning VR1 fully clockwise, press the OK key while keeping VR1 turned fully clockwise.

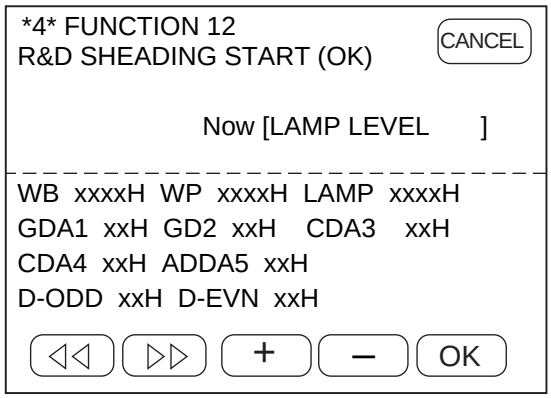

Figure 3-1020

10) In a while, 'Now [END]' will appear on the screen, indicating the end of shading auto correction.

6 Updating

- Replace the ROM DIMM (double inline memory module) on the image processor or update it by downloading as discussed.
- Downloading will update the ROM DIMM; you must replace the following ROMs to update:
- IC103 (DC controller PCB)
- IC104 (DC controller PCB)

a. Replacing the ROM DIMM

1 Removing the ROM DIMM

1) Turn off the main power switch.
2) Disconnect the power cord from the power outlet.
3) Remove the copyboard glass, lens cover, and IP cover.
4) While opening the claw of the slot, lift the ROM DIMM to remove.

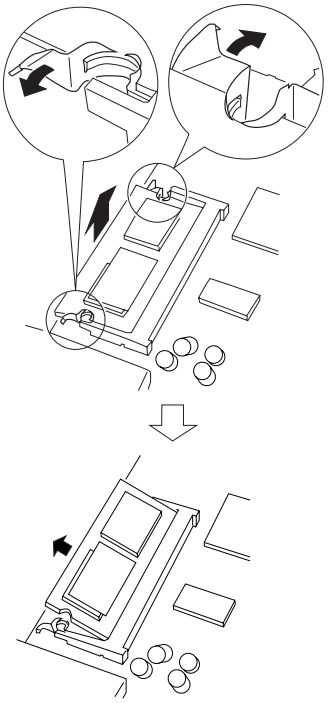

Figure 3-1021

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2 Installing the ROM DIMM

1) Insert the ROM DIMM into the slot at an angle.

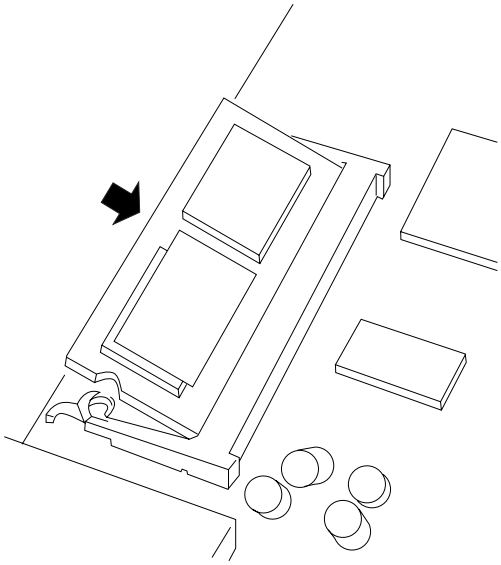

Figure 3-1022

2) Shift down the ROM DIMM.
   - Shift it down in the direction of the arrow until a click is heard.

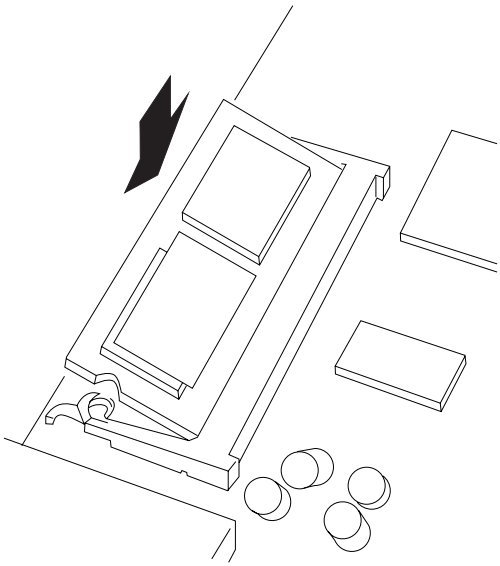

Figure 3-1023

3) Install the removed covers, and connect the power cord into the power outlet; then, turn on the main power switch.

b. Downloading

■ **Tools Required**

- PC (The utility program for upgrading and the new program to be written to the ROM DIMM must have been installed in advance.)
- RS232C cable

■ **Downloading**

1) Turn off the main power switch.
2) Open the front door, and remove the connector cover for servicing; connect the copier to the PC with an RS232C cable.

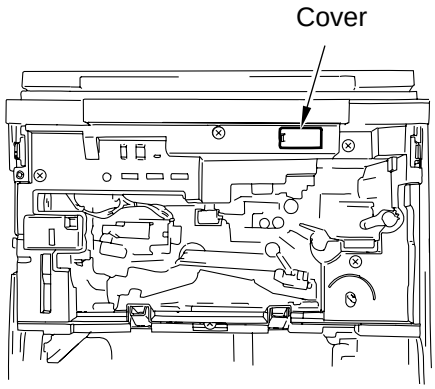

Figure 3-1024

3) Insert the handle of the separation static eliminator cleaning brush into the fixing assembly releasing assembly, and insert the door switch actuator into the door switch assembly.

4) Turn on the main power switch. Then, press the service switch, and press the * key twice.
5) Press 'FUNCTION' (*4*) on the screen to highlight; then, press the OK key.

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6) Press the Page key to bring up the Downloading screen.

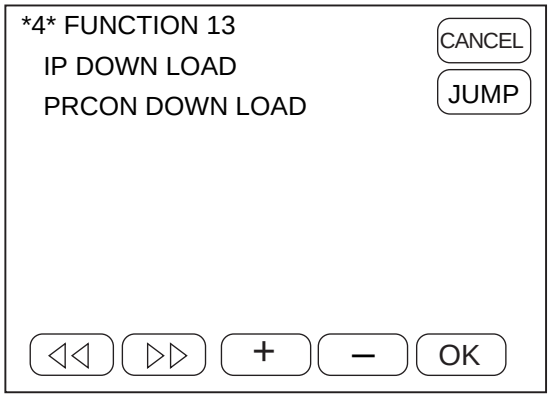

Figure 3-1025

7) Press 'IP DOWNLOAD' on the screen to highlight; then, press the OK key.
   - A press on the OK key will automatically shut down and boot the power.
   - When the machine boots up, it will show the following screen to indicate that it is in downloading mode:

7 AE Adjustment

The machine's AE (auto density adjustment) mode may be either "priority on speed mode" or "priority on image quality mode." Each of these modes may be adjusted in service mode, and the concepts used for the modes are as follows:

1. Priority on Speed Mode

Use 'ABC_TBL' under 'ADJUST' in service mode (*3*).

- A lower value for 'ABC_TBL' will make the text darker; between 1 and 9.
- A higher value for 'ABC_TBL' will make the text lighter; between 1 and 9. (factory default: 3)

The adjustment will modify the density correction curve.

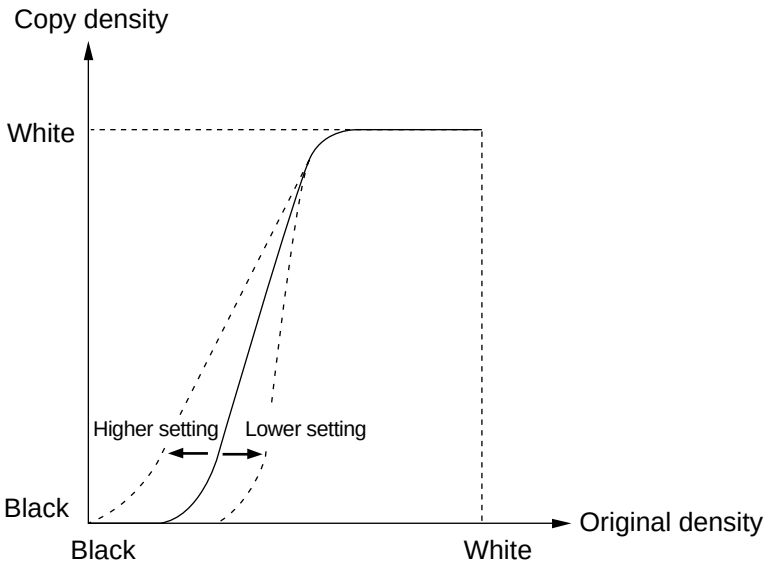

Figure 3-1026

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2. Priority on Image Quality Mode

a. AE_SLOP

For priority on image quality mode, an AE table is selected based on a study of the original density histogram prepared during a pre-scan.

The slice level distinguishing the data into text (black) and background (white) can be adjusted under 'AE_SLOP' in service mode (ADJUT; *3*).

AE_SLOP: A higher setting makes the images darker; between 1 and 19. (left of Figure 3-1027)

b. AE_LIGHT/AE_DARK

The AE table selected as a result of a pre-scan may be corrected to suit the preference of the user.

AE_LIGHT: A higher setting emphasizes the background of the original; a lower setting, on the other hand, de-emphasize the background of the original; between 0 and 40 with the default at 20. (upper right of Figure 3-1027)

AE_DARK: A higher setting will increase black; a lower setting, on the other hand, will decrease black; between 0 and 40 with the default at 20. (Figure 3-1027)

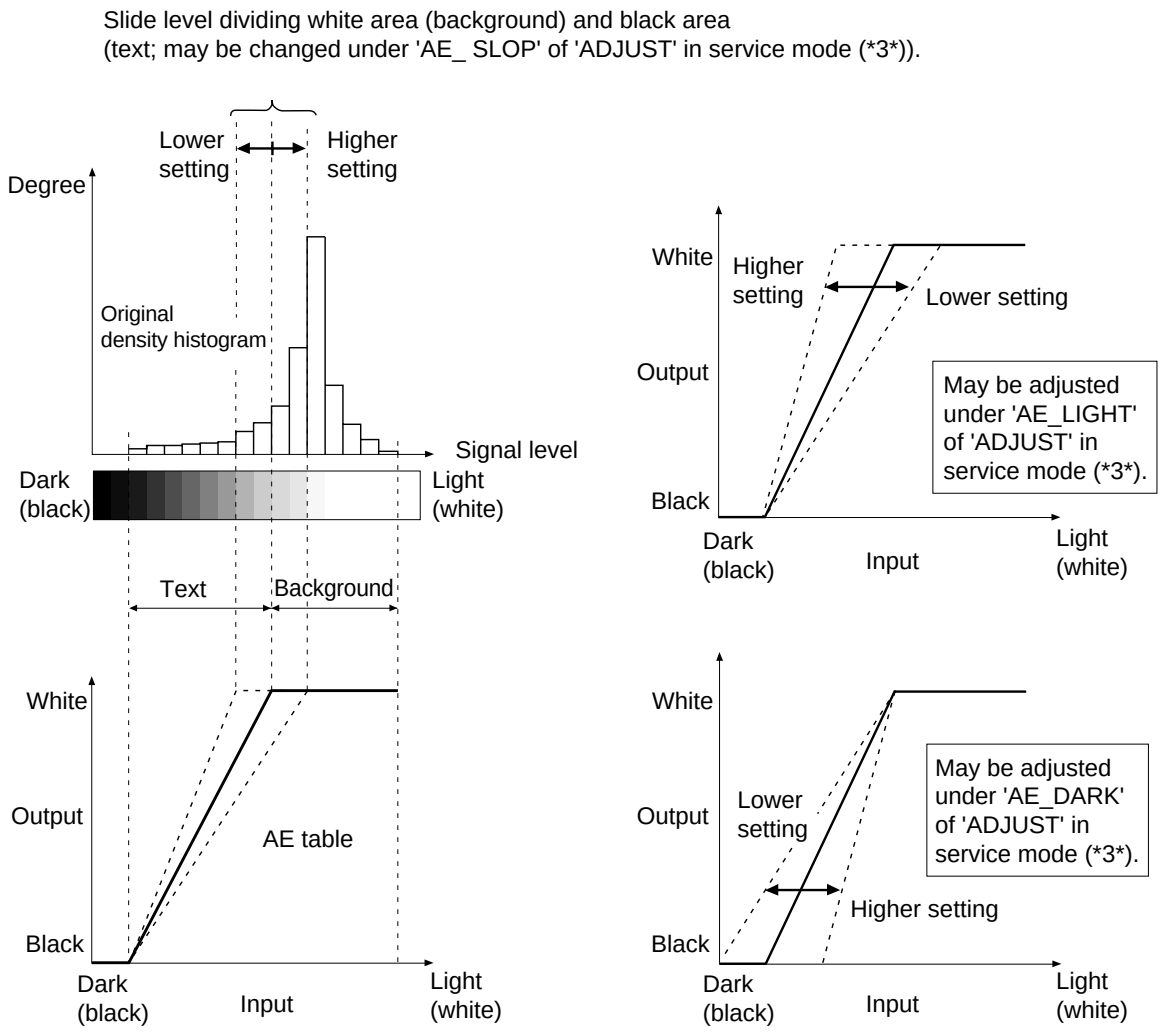

Figure 3-1027

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8 Checking the Photointerrupters

The photointerrupters may be checked either using a conventional tester or using service mode.

1. Using a Tester

1) Set the tester range to 12 VDC.
2) Connect the tester probe to GND (0 VDC) of the DC controller PCB.
3) Make checks as instructed.

2. Using Service Mode

1) Open the front door, and insert the door switch actuator into the door switch assembly; then, insert the handle of the static eliminator cleaning brush into the fixing assembly releasing assembly.
2) Press the service switch.
3) Press the * key twice, and press 'I/O DISPALY' (*2*) to highlight; then, press the OK key.
4) Press the Page key to select the screen showing the desired address.

No.	PS1		PS2		PS3	
Name	Scanner home position sensor (SCHP)		Fixing film sensor (FFD)		Copyboard cover open/closed sensor (CBCC)	
Tester probe	J107-A2		J109-3		J113-B9	
Service mode	—		DC PA0-bit0		DC PA0-bit1	
Make checks; normal if as indicated.	Move the scanner from home position during standby.		Move the detecting lever by hand during standby.		Open/close the copyboard cover during standby.	
	The scanner is at home position.	The scanner is not at home position.	The light-blocking plate is present.	The light-blocking plate is absent	The copyboard cover is closed.	The copyboard cover is opened.
Display reading	—	—	1	0	1	0
Tester reading	about 5 V	about 0 V	about 5 V	about 0 V	about 5 V	about 0 V

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No.	PS4		PS5		PS6	
Name	Multifeeder paper sensor (MFPD)		Pre-registration paper sensor (PDP1)		Fixing assembly delivery paper sensor (PDP3)	
Tester probe	J113-A11		J113-A5		J109-6	
Service mode	DC PA0-bit2		DC PA0-bit3		DC PA0-bit5	
Make checks; normal if as indicated.	Place paper on the paper tray of the multifeeder during standby.		Open the right door during standby, and put copy paper over the pre-registration paper sensor.		Put copy paper over the delivery paper sensor during standby.	
	Paper is not placed.	Paper is placed.	Copy paper is not put over the sensor.	Copy paper is put over the sensor.	Copy paper is not put over the sensor.	Copy paper is put over the sensor.
Display reading	1	0	1	0	1	0
Tester reading	about 5 V	about 0 V	about 5 V	about 0 V	about 5 V	about 0 V

No.	PS8		PS9		PS10	
Name	Vertical path paper sensor (PDP4)		Right door open/closed sensor (RDOP)		Waste toner sensor (STDT)	
Tester probe	J113-A2		J113-A8		J113-B6	
Service mode	DC PA0-bit9		DC PA0-bit10		DC PA0-bit11	
Make checks; normal if as indicated.	Move up the sensor lever of PS8 during standby.		Open the right door during standby.		Move the sensor lever during standby.	
	The lever is moved up.	The lever is returned.	The right door is closed.	The right door is opened.	The light-blocking plate is present.	The light-blocking plate is absent.
Display reading	1	—	1	0	1	0
Tester reading	about 5 V	about 0 V	about 5 V	about 0 V	about 5 V	about 0 V

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No.	PS11		PS12		PS13	
Name	Pre re-pick up paper sensor (PDP5)		Duplexing unit inlet paper sensor (PDP6)		Delivery sensor (PDP7)	
Tester probe	J103-2		J105-B2		J105-A2	
Service mode	DC PC0-bit0		DC PC0-bit1		DC PC0-bit2	
Make checks; normal if as indicated.	Move the sensor flag of PS11 during standby.		Move the sensor flag of PS12 during standby.		Move the sensor flag of PS13 during standby.	
	The sensor flag is down (the light-blocking plate is present).	The sensor flag is up (the light-blocking plate is absent).	the sensor flag is down (the light-blocking plate is present).	The sensor flag is up (the light-blocking plate is absent).	The sensor flag is down (the light-blocking plate is present).	The sensor flag is up (the light-blocking plate is absent).
Display reading	1	0	1	0	1	0
Tester reading	about 5 V	about 0 V	about 5 V	about 0 V	about 5 V	about 0 V

No.	PS14	
Name	Horizontal paper sensor (CRGPD)	
Tester probe	J114-B2	
Service mode	DC PC0-bit6	
Make checks; normal if as indicated.	Open the right door, and insert copy paper into the re-pick up paper path during standby; then, inside the copy paper toward the rear.	
	Before sliding the copy paper toward the rear.	When the copy paper is slid toward the rear.
Display reading	1	0
Tester reading	about 5 V	about 0 V

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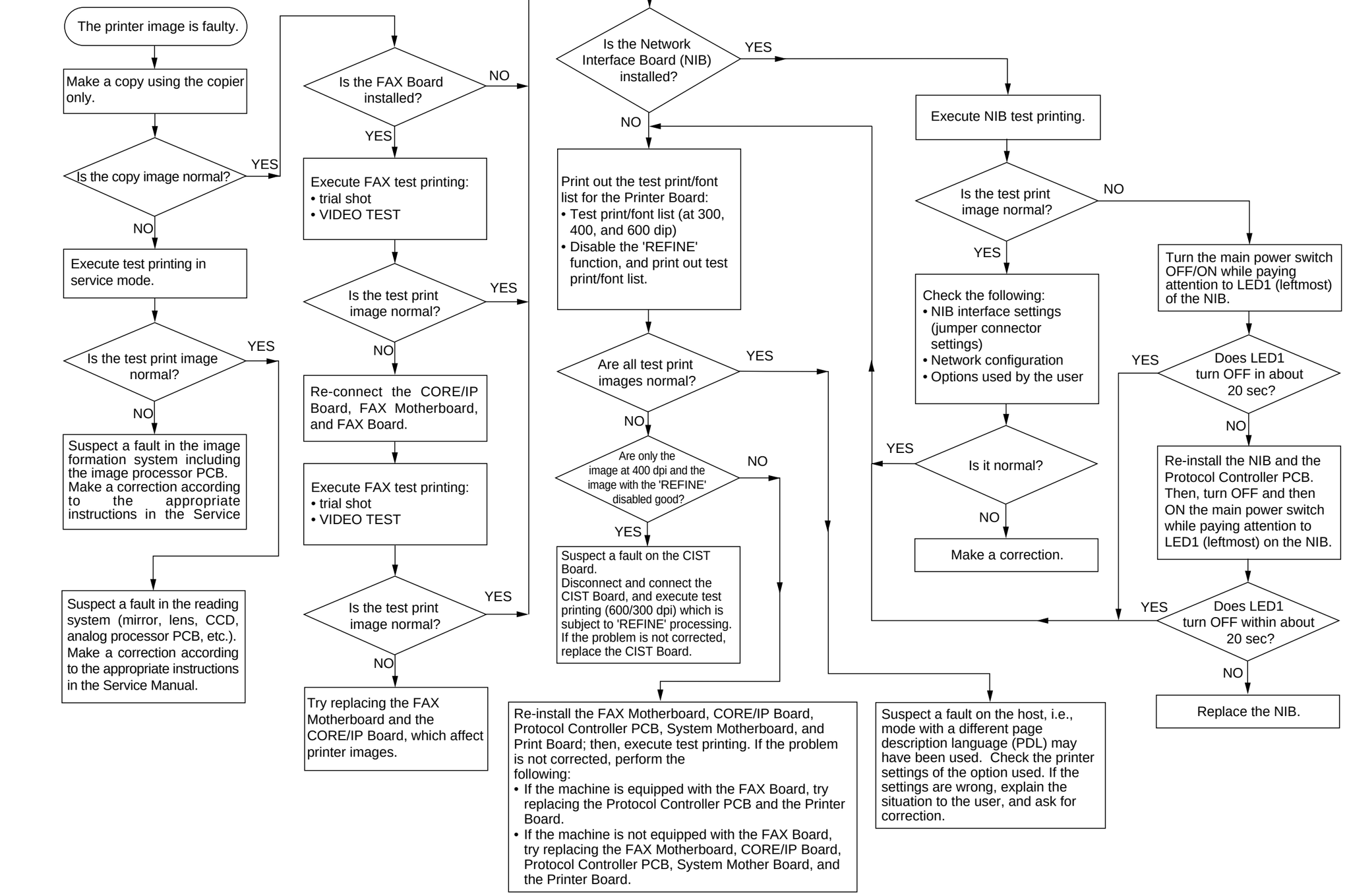
9 Isolating the PCBs (printer image fault)


The printer image is faulty.
Make a copy using the copier only.
Is the copy image normal?
YES
NO
Execute test printing in service mode.
Is the test print image normal?
YES
NO
Suspect a fault in the image formation system including the image processor PCB. Make a correction according to the appropriate instructions in the Service
Suspect a fault in the reading system (mirror, lens, CCD, analog processor PCB, etc.). Make a correction according to the appropriate instructions in the Service Manual.
Is the FAX Board installed?
NO
YES
Execute FAX test printing:
• trial shot
• VIDEO TEST
Is the test print image normal?
YES
NO
Re-connect the CORE/IP Board, FAX Motherboard, and FAX Board.
Execute FAX test printing:
• trial shot
• VIDEO TEST
Is the test print image normal?
YES
NO
Try replacing the FAX Motherboard and the CORE/IP Board, which affect printer images.
Is the Network Interface Board (NIB) installed?
YES
NO
Print out the test print/font list for the Printer Board:
• Test print/font list (at 300, 400, and 600 dip)
• Disable the 'REFINE' function, and print out test print/font list.
Are all test print images normal?
YES
NO
Are only the image at 400 dpi and the image with the 'REFINE' disabled good?
NO
YES
Suspect a fault on the CIST Board.
Disconnect and connect the CIST Board, and execute test printing (600/300 dpi) which is subject to 'REFINE' processing. If the problem is not corrected, replace the CIST Board.
Re-install the FAX Motherboard, CORE/IP Board, Protocol Controller PCB, System Motherboard, and Print Board; then, execute test printing. If the problem is not corrected, perform the following:
• If the machine is equipped with the FAX Board, try replacing the Protocol Controller PCB and the Printer Board.
• If the machine is not equipped with the FAX Board, try replacing the FAX Motherboard, CORE/IP Board, Protocol Controller PCB, System Mother Board, and the Printer Board.
Execute NIB test printing.
Is the test print image normal?
NO
YES
Check the following:
• NIB interface settings (jumper connector settings)
• Network configuration
• Options used by the user
Is it normal?
YES
NO
Make a correction.
Suspect a fault on the host, i.e., mode with a different page description language (PDL) may have been used. Check the printer settings of the option used. If the settings are wrong, explain the situation to the user, and ask for correction.
Turn the main power switch OFF/ON while paying attention to LED1 (leftmost) of the NIB.
Does LED1 turn OFF in about 20 sec?
YES
NO
Re-install the NIB and the Protocol Controller PCB. Then, turn OFF and then ON the main power switch while paying attention to LED1 (leftmost) on the NIB.
Does LED1 turn OFF within about 20 sec?
YES
NO
Replace the NIB.

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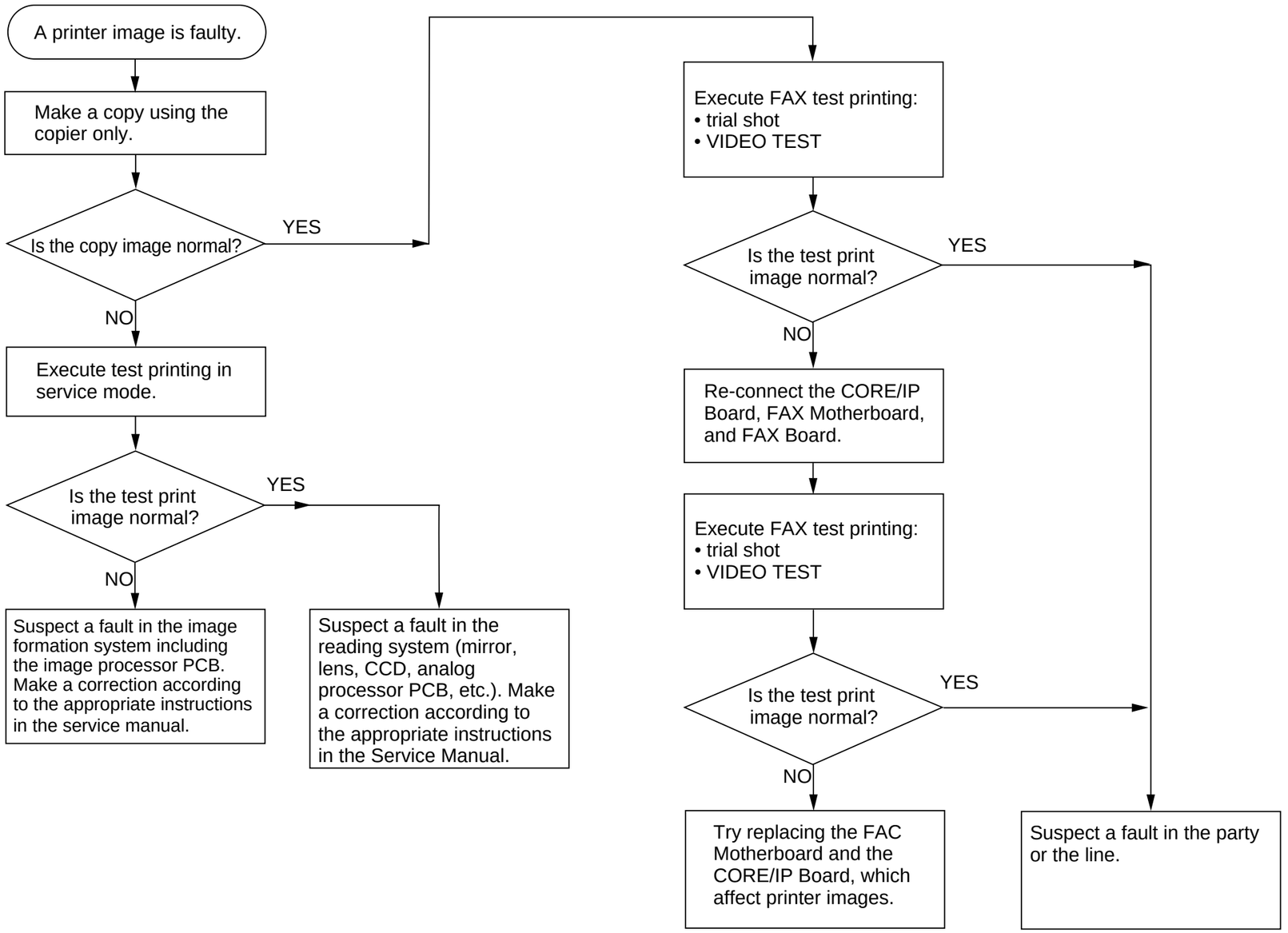
10 Isolating the PCBs (FAX image fault)


A printer image is faulty.
Make a copy using the copier only.
Is the copy image normal?
YES
NO
Execute test printing in service mode.
Is the test print image normal?
YES
NO
Suspect a fault in the image formation system including the image processor PCB. Make a correction according to the appropriate instructions in the service manual.
Suspect a fault in the reading system (mirror, lens, CCD, analog processor PCB, etc.). Make a correction according to the appropriate instructions in the Service Manual.
Execute FAX test printing:
• trial shot
• VIDEO TEST
Is the test print image normal?
YES
NO
Re-connect the CORE/IP Board, FAX Motherboard, and FAX Board.
Execute FAX test printing:
• trial shot
• VIDEO TEST
Is the test print image normal?
YES
NO
Try replacing the FAC Motherboard and the CORE/IP Board, which affect printer images.
Suspect a fault in the party or the line.

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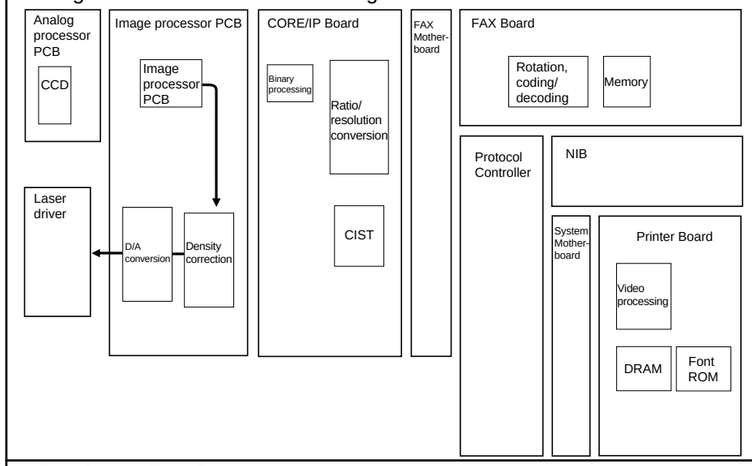
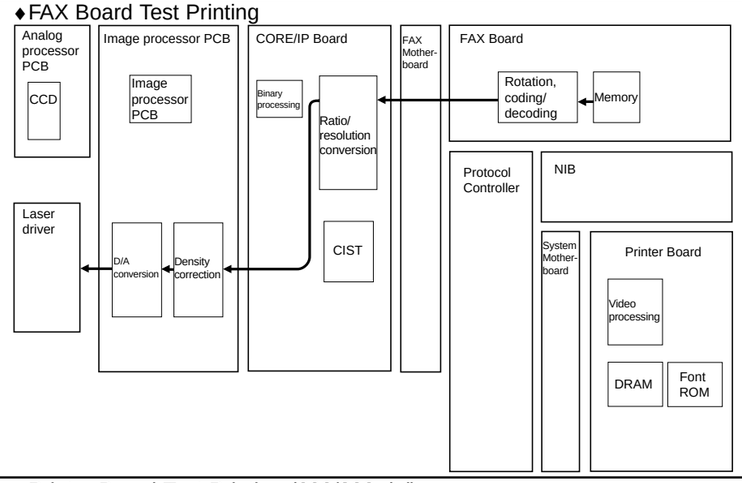
11 Test Printing

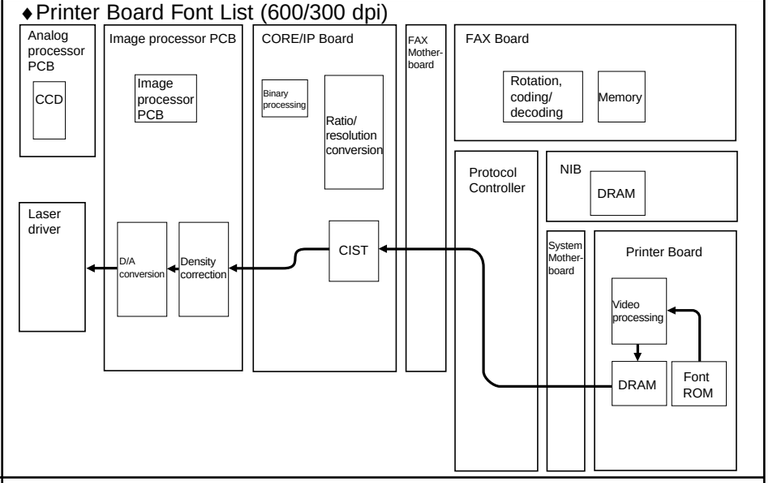
♦Image Processor PCB Test Printing



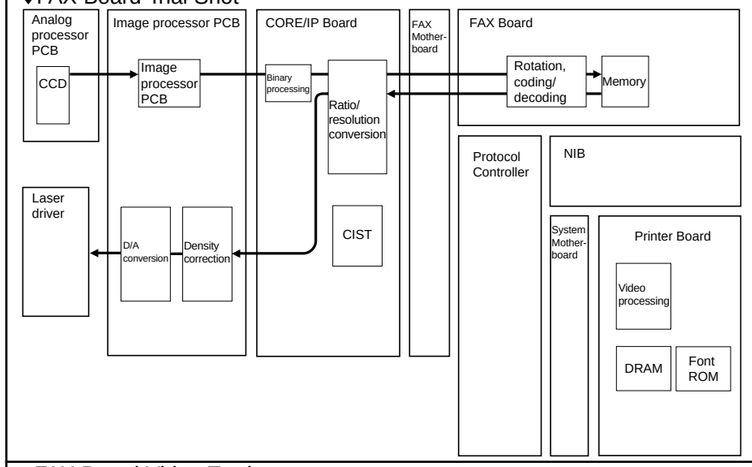
♦FAX Board Test Printing



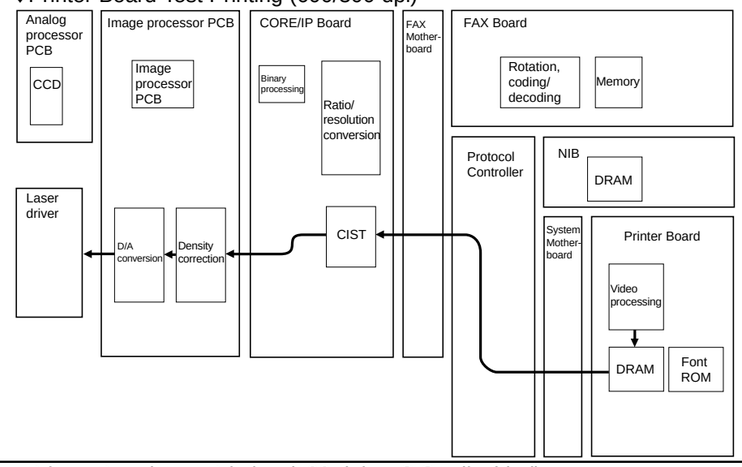
♦Printer Board Font List (600/300 dpi)



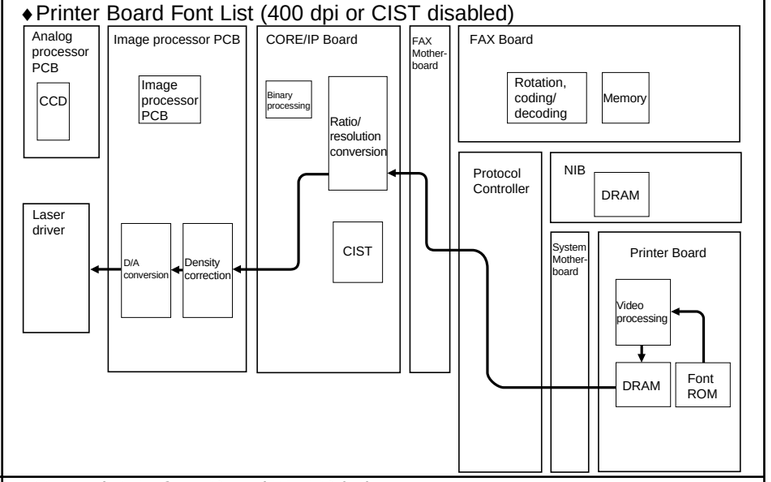
♦FAX Board Trial Shot



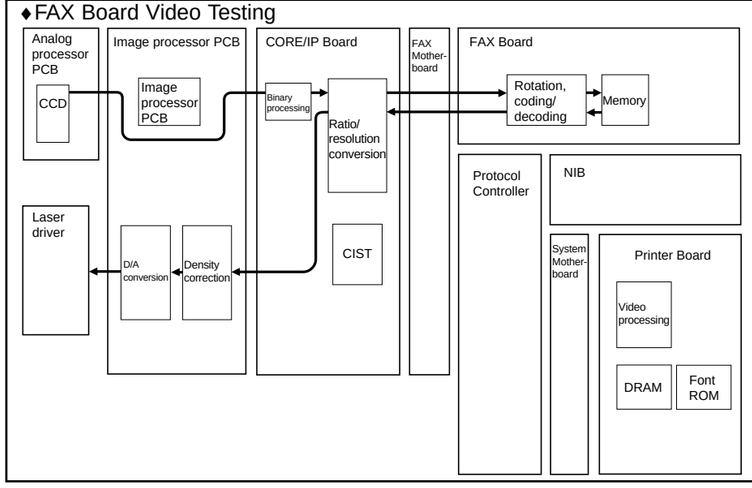
♦Printer Board Test Printing (600/300 dpi)



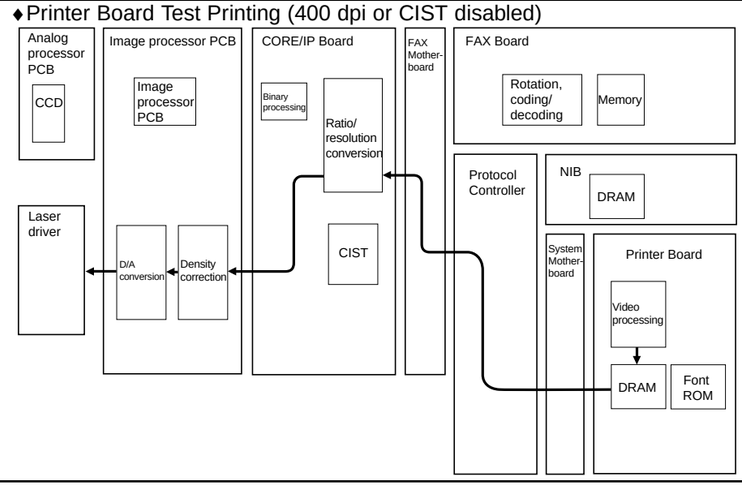
♦Printer Board Font List (400 dpi or CIST disabled)



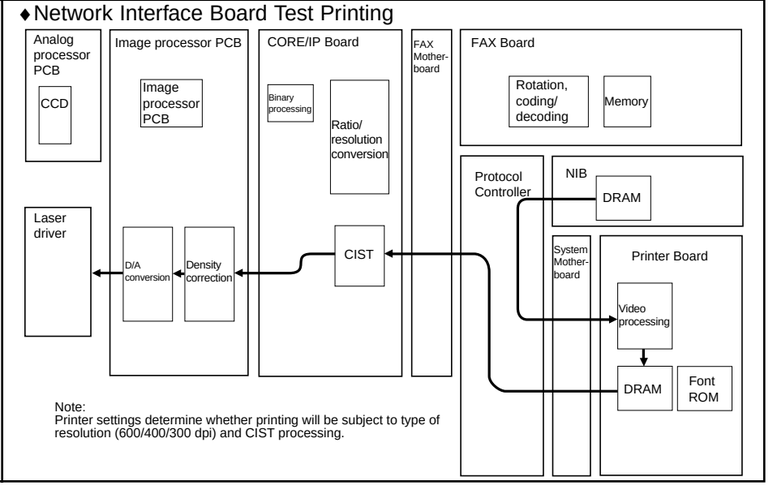
♦FAX Board Video Testing



♦Printer Board Test Printing (400 dpi or CIST disabled)



♦Network Interface Board Test Printing



Note:
Printer settings determine whether printing will be subject to type of resolution (600/400/300 dpi) and CIST processing.

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XI. SELF DIAGNOSIS

The machine is equipped with a self diagnostic mechanism that checks its condition (sensors, in particular) and indicates a code on the control panel upon detection of an error.

A. Copier

Code	Main cause	Description
E000	The fixing temperature fails to rise. • Thermistor (TH1; poor contact, open circuit) • Heater driver (faulty) • DC controller PCB	• The main thermistor (TH1) detects less than 50°C for 200 ms 1 sec after voltage has been applied to the heater. • The main thermistor (TH1) detects less than 90°C for 200 ms 2 sec after voltage has been applied to the heater. • The sub thermistor (TH2) detects less than 90°C for 200 ms 4 sec after voltage has been applied to the heater.
E001	The fixing temperature rises abnormally. • Thermistor (TH1, TH2; short circuit) • DC controller PCB (faulty)	• The main thermistor (TH1) detects more than 250°C for 200 ms during copying operation. • The sub thermistor (TH2) detects more than 260°C for 200 ms during copying operation. • The main thermistor (TH1) detects a temperature in excess of a specific temperature by 30°C or more for 200 ms during copying operation. • The thermistor (TH1, TH2) detects an increase in temperature of 40°C or more during standby. • The main thermistor (TH1) detects an increase in temperature of 100°C or more in 1 sec. • The main thermistor (TH1) detects in increase in temperature of 100°C or more in 1 sec.
E002	The fixing temperature fails to reach a specific value. • Thermistor (TH1, TH2; off contact, poor contact, open circuit) • Fixing heater (open circuit; cracking) • Fixing heater drive circuit (faulty)	• The main thermistor detected less than 105°C for 200 ms 1 sec after it has detected 90°C. • The main thermistor (TH1) detected less than 120°C for 200 ms 1 sec after it has detected 105°C. • The main thermistor detected less than 120°C for 200 ms after it has detected 105°C. • The main thermistor (TH1) detects less than 135°C for 200 ms 1 sec after it has detected 120°C. • The main thermistor (TH1) detects less than 150°C for 200 ms 1 sec after it has detected 135°C.

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Code	Main cause	Description
E003	The fixing temperature drops abnormally. • Thermistor (TH1, TH2; off contact, poor contact, open circuit) • Fixing heater (open circuit, cracking) • Fixing heater drive circuit (faulty) • DC controller PCB (faulty)	• The main thermistor (TH1) detects less than 150°C for 200 ms after it has detected 150°C. • The sub thermistor (TH2) detects less than 150°C for 200 ms after it has detected 150°C.
E007	The fixing film has become displaced. • Fixing film (wrong position, tear) • Tension roller (wrong position, wrong operation) • Fixing film motor (faulty) • Fixing film sensor (faulty)	• The output of the fixing film sensor continues to be ‘1’ or ‘0’ for 2.1 sec or more.
E007 -01	The fixing film has become fully displaced. • Fixing film (recovery mechanism fault)	• The displacement is not corrected after executing film recovery mode which turns on when the main power is tuned off and on in response to ‘E007’.
E010	The main motor fails to lock. • Main motor (M1; faulty) • DC controller PCB (faulty)	• The main motor does not lock for 10 sec after it is started. • The value is outside a specific range, and the main motor does not lock for 3 sec.
E030	The total counter fails to operate. • Total counter (CNT1,CNT2; open circuit) • DC controller PCB (faulty)	• A check is made immediately before the counter turns on and off. (Normal, if the counter drive signal is ‘0’ when the counter turns on.)
E031	The option counter fails to operate. • Option counter (CNT3; open circuit) • DC controller PCB (faulty)	• A check is made immediately before the counter turns on and off. (Normal, if the counter drive signal is ‘0’ when the counter turns on.)
E032	The copy data controller counter is faulty. • Communication (counter data between Copy Data Controller and copier) • DC controller PCB (faulty)	• The count data is not detected by the Copy Data Controller within a specific period of time after the copier has generated the copy start signal.
E051	The horizontal registration home position detection mechanism fails. • Horizontal registration sensor (PS14; faulty) • Horizontal registration motor (M9; faulty) • DC controller PCB (faulty)	• The home position is not detected after generation of the horizontal registration drive signal.

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Code	Main cause	Description
E064	The high-voltage (primary charging, transfer charging, developing) output is faulty. • Composite power supply PCB (faulty) • DC controller PCB (faulty) • Wiring (faulty; short circuit, open circuit)	• The difference between the high-voltage control signal and the actual high-voltage output is more than a specific value. • Any of the primary charging roller, transfer charging roller, and developing bias has an output error.
E100	A BD error has occurred. • Laser unit (faulty) • BD PCB (faulty) • Laser driver PCB (faulty) • Image processor PCB (faulty)	• The BD signal is not generated within 2 sec after the laser has been turned on. • The BD signal cycle has a discrepancy.
E110	The laser scanner motor fails to lock. • Laser scanner motor (M3; faulty) • Laser scanner driver PCB (faulty) • DC controller PCB (faulty)	• A specific speed is not reached after the laser scanner motor drive signal has been generated. • The speed deviates after it has reached a specific speed.
E190	The RAM has an error.	
E191	An error has occurred in serial communication between the DC controller PCB and the composite power supply PCB.	• The communication data is not updated for 8 sec or more. • The check sum of the communication data is different for three times in a row.
E202 • No code indication. • Keys on control panel locked.	The scanner home position cannot be detected. • Scanner home position sensor (PS1; faulty) • Scanner motor (Faulty) • DC controller PCB (faulty)	• The scanner does not return to home position after it has started to move.
E220	• Scanning lamp (error activation) • Scanning lamp (faulty) • Composite power supply PCB (faulty) • DC controller PCB (faulty)	• Activation of the lamp has been detected during standby. • Deactivation of the lamp has been detected during copying.
E240	An error in the communication with the DC controller PCB has occurred. • DC controller PCB (faulty) • Image processor PCB (faulty)	• An error has been detected in the communication between the DC controller PCB an the image processing PCB.

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Code	Main cause	Description
E243	An error has occurred in communication with the control panel. • Control panel CPU (error) • Image processor PCB (faulty)	An error has been detected in the communication between the CPU on the control panel and the image processor PCB.
E261	There in an error in the zero cross signal. • Power supply frequency (fluctuation) • Composite power supply PCB (faulty)	The intervals of zero cross signals are outside the allowed range.
E301	The intensity of the scanning lamp is not correctly adjusted. • Intensity sensor (faulty) • Scanning lamp (faulty) • DC controller PCB (faulty)	
E710	An error in IPC communication has occurred.	• BS does not go '1' for 3 sec.
E711	An error in IPC communication has occurred.	• DT has been written in the error register four times.
E712	An error in communication with the feeder has occurred.	• The communication has been interrupted.
E713	An IC error has occurred (sorter).	• The communication has been interrupted.
E716	An error has occurred in communication with the pedestal.	• The communication has been interrupted.
E717	An error has occurred in communication with the Copy Data Controller.	The communication has been interrupted.
E803	An error has occurred in the output voltage of the composite power supply PCB. Both ends of the fluorescent lamp has blackened because of deterioration.	The output voltage (+24Vu or +24VR) of the composite power supply PCB has an error.

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Action to Take in Response to Error Codes

- When the self diagnosis function has turned ON and an error code has been indicated, you can reset the machine by turning its power switch OFF once.
  E000, E001, E002, E003, E004, and E007–01, and E717 is not reset by turning OFF the power switch; this is to prevent the user from casually resetting the machine, since such could sometimes damage the machine.

Resetting

1) Start service mode by pressing the service switch and then pressing the * key twice.
2) Press 'FUCNTION' on the LCD to highlight; then, press the OK key.
3) Press 'ERROR' on the LCD to highlight; then, press the OK key.

- This will automatically remove and then supply power.
- In the case of 'E202', the keys on the control panel will be locked without indicating an error code; use 'ERR' under 'DISPLAY' in service mode (*1*) if this is the case.
- In the case of 'E007', turning off and then on the main power switch will activate film recovery mode ('FILM_COMEBACK' in service mode *4*), thereby resetting the machine after returning the film to its correct position.
  If the film fails to return to the correct position after executing this recovery mode, 'E007-01' will be indicated. If this happens, replace the fixing assembly or take appropriate measures, return the film to its correct position, and execute 'ERROR' in service mode (*4*).
  Note that 'E007-01' in service mode will be indicated as 'E007', omitting the last two digits under 'ERR' of 'DISPLAY' in service mode (*1*).
  After the film has returned to normal position following the execution of 'FILM COMEBACK', be sure to turn OFF and then ON the main power supply without touching the other keys.

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B. Self Diagnosis of the RDF-G1

Code	Main cause	Description
E400	• Data communication with copier (faulty)	• The communication is monitored at all times. This error is identified when the communication with the copier is disrupted for 5 sec or more.
E401	• Pick-up motor (M1; fails to rotate) • Pick-up roller sensor (S5; faulty)	• A flag is installed on the shaft of the pick-up motor (M1), and the rotation of M1 is monitored in reference to the flag blocking the pick-up roller sensor (S5). This error is identified when S5 does not turn on and off twice or more within 1 sec.
E402	• Belt motor (M3; fails to rotate) • Belt motor clock sensor (S10; faulty)	• The number of belt clock pulses for 200 ms is below a specific value.
E403	• Feeder motor (M2; fails to rotate) • Feeder motor clock sensor (S9; faulty)	• The number of feeding motor clock pulses for 200 ms is below a specific value.
E411	• Original tray paper sensor (S1; faulty) • Registration sensor (S3; faulty)	• The sensor output is 2.3 V or more in the absence of paper.

C. Self Diagnosis of the ADF-F1

Code	Main cause	Description
E422	• Data communication with the copier (faulty)	• Communication with the copier has been disrupted for 5 sec or more during stand-by. • Communication with the copier has been disrupted for 0.5 sec or more during operation.

Caution:

1. Turn off the copier's power switch once if the self diagnosis mechanism has turned on.
2. You may continue to make copies even when the RDF is out of order; open the RDF, and place originals on the copyboard glass.

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D. Self Diagnosis of the Pedestal

Code	Main cause	Description
E716	The pedestal has an error. • Pedestal controller PCB (faulty) • Connector (poor contact) • 24V power supply (faulty)	The communication IC (Q101) on the pedestal controller PCB has gone out of order.
E901	• Pedestal motor (M20; faulty) • Pedestal controller PCB (faulty)	• The rotation speed fails to reach a specific value within 10 sec after the pedestal motor has turned on. • The rotation speed has deviated from a specific value for 3 sec or more while the motor is rotating.

E. Self Diagnosis of the Multi Output Tray -C1

Code	Main cause	Description
E422	The shift tray home position sensor fails.	• The home position detection signal does not turn on within 5 sec during shift tray home position search.

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F. Self Diagnosis of the Multi Output Tray-12

Code	Main cause	Description
E500	The CPU (Q7) on the tray controller PCB or the communication IC (Q11) is not operating normally.	An error has occurred in the communication between the multi tray and the copier.
E510	• The bin unit feeding motor (M2) fails to rotate. • The bin unit feeding motor clock sensor (PI2) has a fault.	The bin unit feeding motor clock sensor (PI2) does not receive clock signals 4.0 sec or more after the bin unit feeding motor drive signal (BFMD) has been generated.
E515	• The tray feeding motor (M6) fails to rotate. • The tray feeding motor clock sensor (PI6) has a fault.	The tray feeding motor clock sensor (PI6) does not receive clock signals for 1 sec or more after the tray feeding motor drive signal (TFMD) has been generated.
E521	• The tray shift motor (M7) fails to rotate. • The tray position sensor (PI12) has a fault.	The tray position sensor (PI12) does not turn on or off 2.5 sec or more after the tray shift motor drive signal has been generated.
E530	The guide bar drive motor (M4) fails to rotate.	The guide bar home position sensor (PI5) does not turn on or off 2.5 sec or more after the guide bar swing motor drive signal has been generated.

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Code	Main cause	Description
E531	• The stapler motor (M3) does not rotate. • The stapler swing motor (M5) doe not rotate.	• The state of the stapling home position sensor (MS7) does not change within 1 sec after the stapler motor (M3) CW rotation signal has been generated and the state of the stapling home position sensor (MS7) does not change within 1 sec after the stapler motor CCW rotation signal has been generated thereafter. • The stapler position sensor (PI4) does not turn off within 1 sec after the stapler swing motor (M5) has been generated.
E540	• The bin shift motor (M1) does not rotate.	• The lead cam home position sensor (PI1) does not turn off within 1 sec after the bin shift motor drive signal has been generated. • PI1 does not turn on within 1 sec after PI1 has turned off.
E713	The IC (Q7) on the tray controller PCB or the communication IC (Q11) does not operate normally.	An error has occurred in the communication between the multi tray and the copier.

Operation in Response to an Error

1 The copier's message display indicates "TURN ON POWER."
2 When the copier's power has been turned off and then on, the copier will reset the error if the results of self diagnosis it has run are good. (It will indicate an error code if any error is detected.)

Copier Operation with an Error Code On

1 The copier indicates 'E5XX' or 'E713'.
2 The copier allows making copies when the multitray is detached from it*.
3 The copier will indicate a message if modes requiring the use of the multi tray is selected.
*Turn off the joint sensor (MS3; feeding the multitray from the copier); you need not disconnect the communication connector connecting to the copier.

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CHAPTER 4

MECHANICAL SYSTEM

This chapter discusses mechanical characteristics of the machine and explains how to disassemble and assemble the parts.

Keep the following in mind when disassembling or assembling the machine:

1. ⚠ Make sure that the power plug remains disconnected for safety when disassembling or assembling the machine.
2. Assemble the parts by reversing the steps used to disassemble them unless otherwise noted.
3. Identify the types of screws according to length, diameter, and location.
4. Mounting screws used for grounding wires and varistors are provided with washers to ensure electrical continuity. Be sure to use such washers where necessary.
5. As a rule, do not operate the machine with any of its parts removed.
6. Do not remove any screws that are paint-locked during work.

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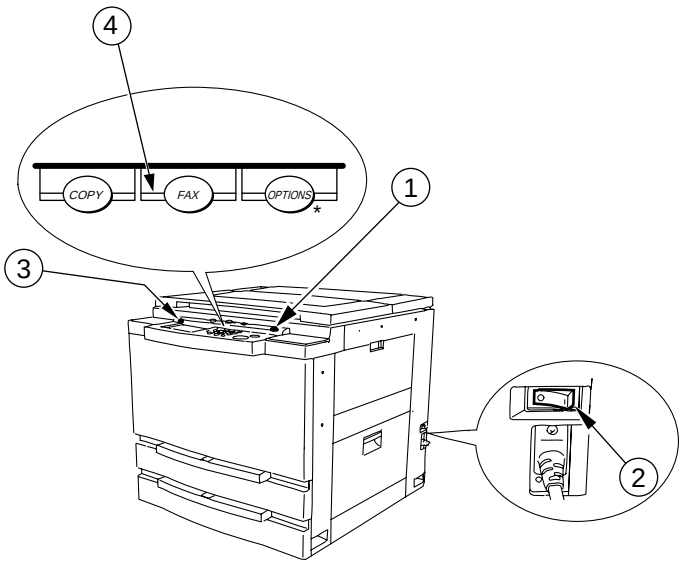
I. BEFORE THE WORK/POINTS TO NOTE

A. Main Power Switch and Others

Be sure to turn OFF the main power switch and disconnect the power plug before starting disassembly/assembly work.

In addition, observe the following:

1. The secondary battery starts to operate (discharge) when the main power switch is turned OFF to retain fax memory images.
   Be sure to finish any work performed with the main power switch off within one hour to save the battery. (The machine must be kept powered for at least one week after installation.)
2. You can check whether there is a fax memory image by referring to the memory tx/rx indicator on the control panel.
   The memory tx/rx lamp is ON when there is a fax memory image. In such a case, print out the memory image; then, turn OFF the power switch, and disconnect the power plug.
3. Some units remain powered after the control panel power switch is turned OFF; be sure to turn OFF the main power switch.
4. Keep in mind that the machine will remain powered even when the front door is opened as long as the control panel power switch and the main power supply switch are ON.



① Control panel power switch
② Main power switch
③ Main power lamp
④ MEMORY TX/RX lamp

* For USA, 'PRIN·I/F'

Figure 4-101

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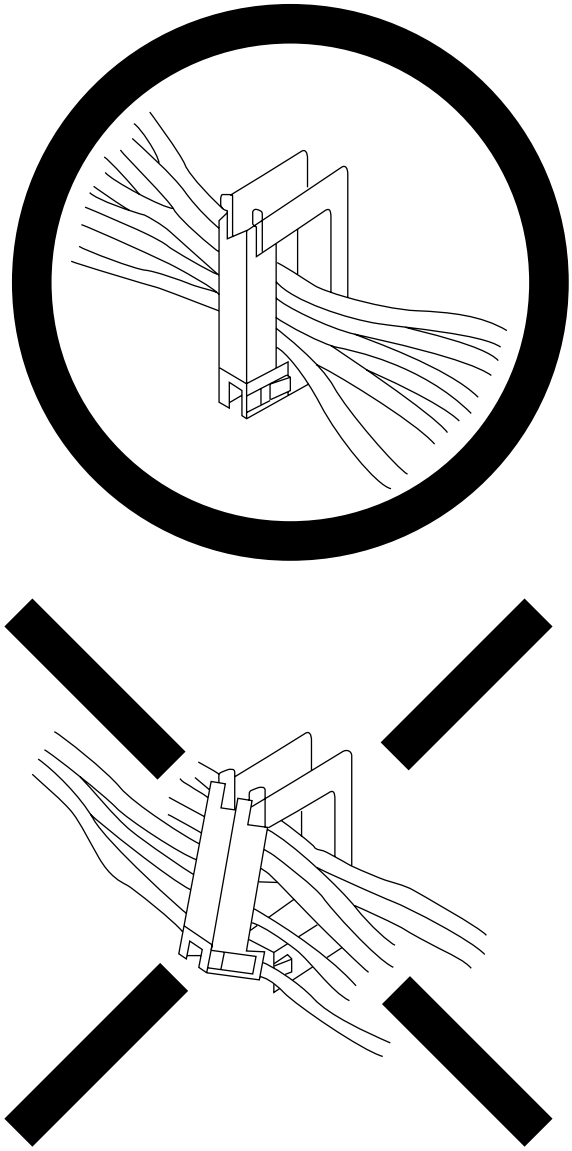
B. Handling the Harnesses

Exercise care when using the harness retainer (square bush) to avoid biting the harnesses.



NO GOOD

Figure 4-102

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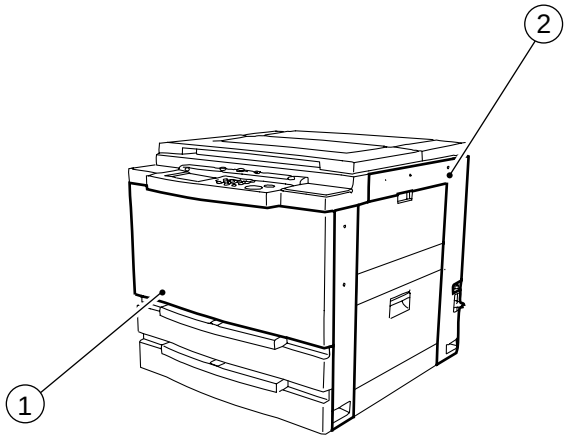
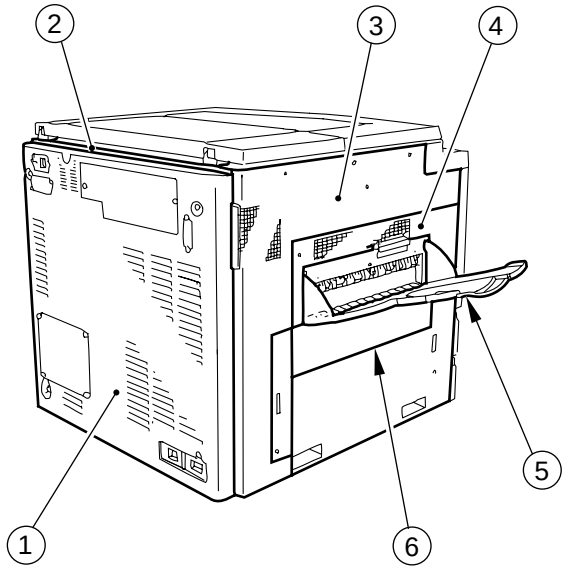
II. EXTERNALS

A. External Covers



① Front door ② Right cover

Figure 4-201



① Rear cover
② Upper rear cover
③ Left cover
④ Delivery assembly cover
⑤ Delivery tray
⑥ Delivery assembly lower cover

Figure 4-202

Note:
Remove the covers as necessary when cleaning, inspecting, or repairing the inside of the machine.
Those covers that can be detached by simply removing their mounting screws and that can be removed on their own are omitted from the discussions.

1. Removing the Right Cover

Skip steps 4) and 5) if the lower right cover is not found.

1) Remove the four screws, and remove the rear cover.
2) Open the front cover.
3) Slide out the cassette.
4) Remove the screw ① from the vertical path cover.

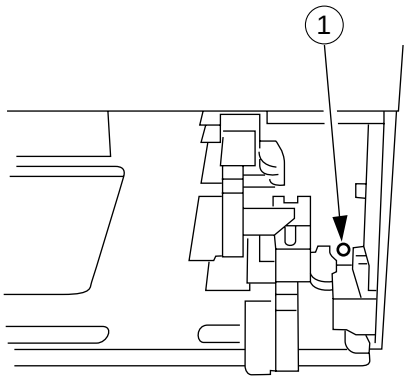


Figure 4-203

5) While pulling the center of the lower right cover ②, release the hook and remove the lower right cover.

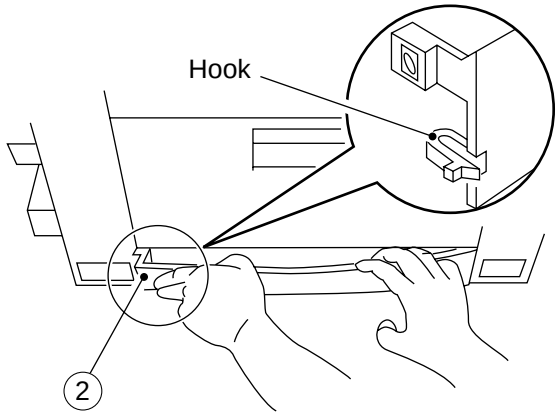


Figure 4-204

6) Open the multifeeder tray.
7) Remove the four screws ③, and remove the right cover ④.

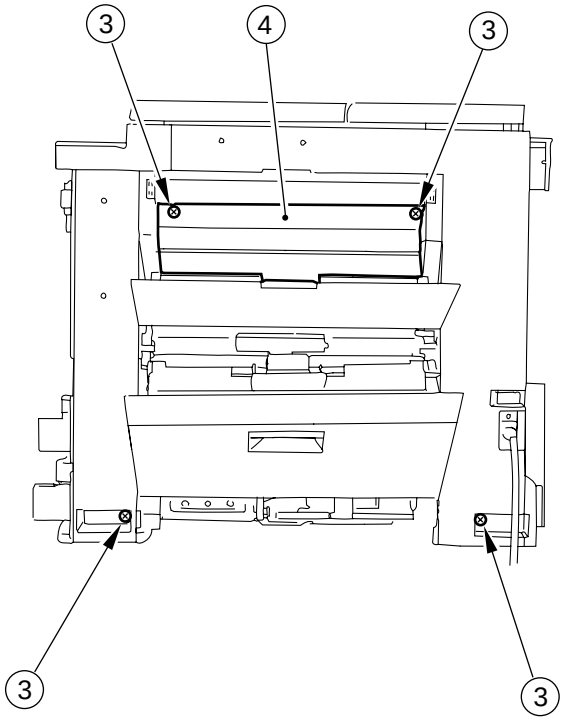


Figure 4-205

B. Inside Cover

1) Remove the screw ①, and open the front door; then, shift and pull off the two pins ② from the hinge to remove the front door.

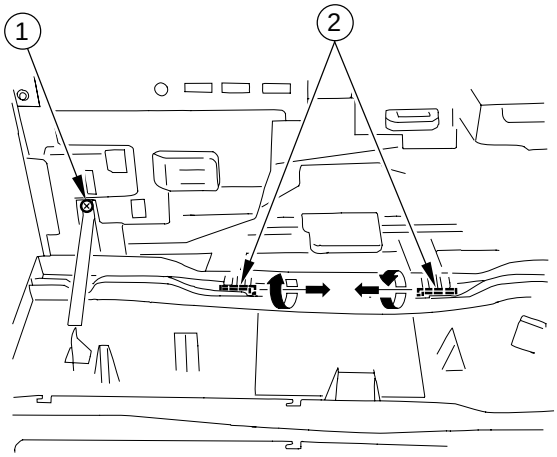


Figure 4-206

2) Remove the screw ④, and remove the fixing cover ③.

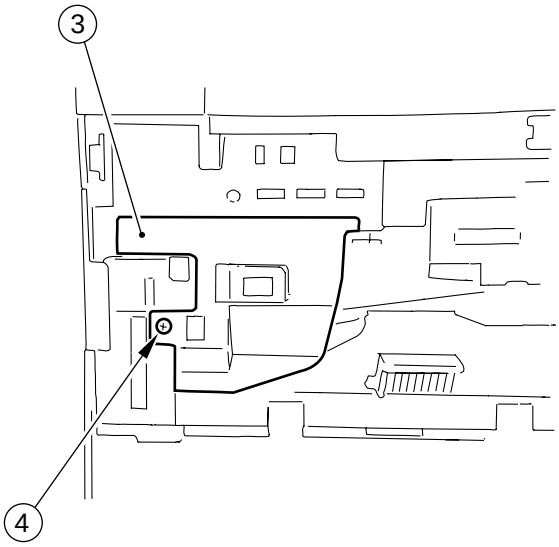


Figure 4-207

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3) Shift the locking lever ⑤ to release the developing assembly; then, remove the knob ⑥ from the drum unit to remove the drum unit.
4) Shift back the locking lever ⑤ to lock the developing assembly in place.

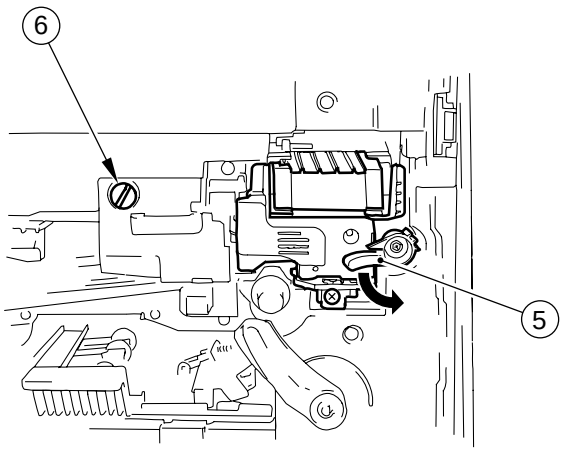

Figure 4-208

5) Release the feeding assembly, and remove the feeding lever ⑦ (1 top ring ⑧) and the registration roller knob ⑨.

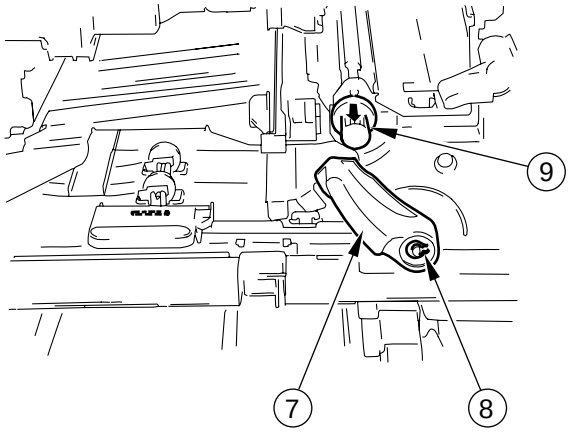

Figure 4-209

6) Slide out the upper cassette.
7) Remove the five screws ⑩, and remove the inside cover.

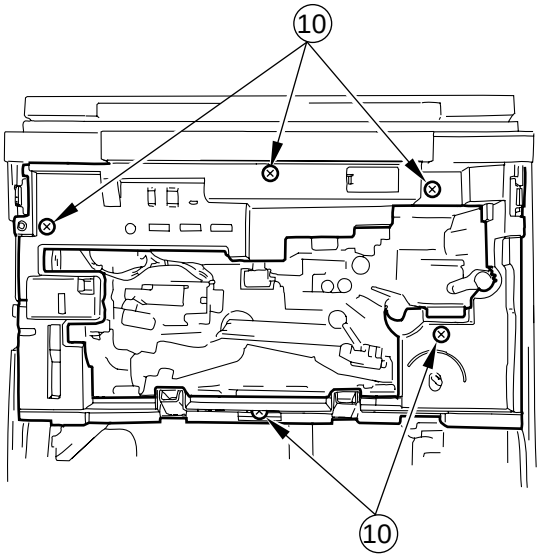

Figure 4-210

C. Control Panel

1. Control Panel

1) Remove the inside cover.
2) Remove the screw, and disconnect the RS232C connector.
3) Remove the screw ②, and remove the fixing controller PCB ①.

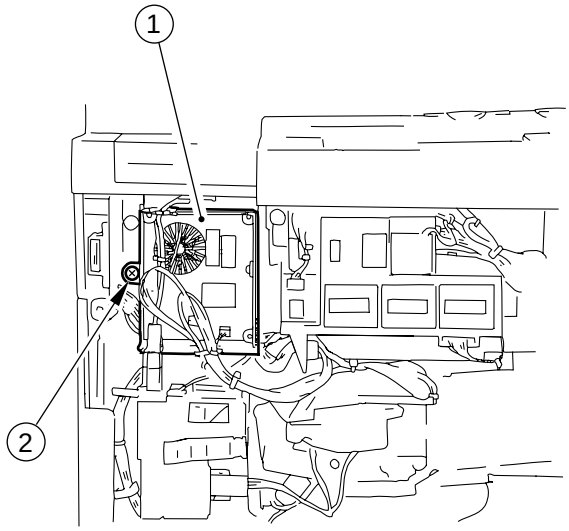

Figure 4-211

4) Remove the screw, and remove the magnet plate from the top of the control panel.
5) Remove the four screws ④, and remove and turn over the control panel ③.

Caution:
Pay attention to the four connectors connected to the control panel when removing and turning over the control panel.

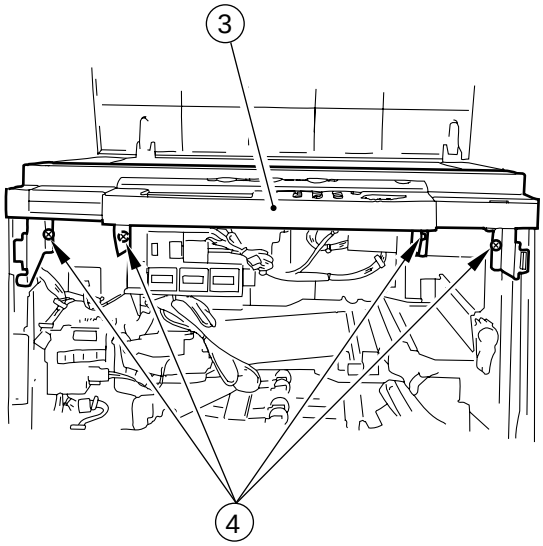

Figure 4-212

6) Disconnect the four connectors.

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D. Fans

1. Removing the Fixing Heat Exhaust Fan

1) Remove the four screws, and remove the rear cover.
2) Remove the screw, and remove the left cover. (Be sure to disengage the four hooks of the left cover.)
3) Disconnect the two connectors ①, remove the two screws ②, and disengage the three hooks ③ to remove the fixing heat exhaust fan.

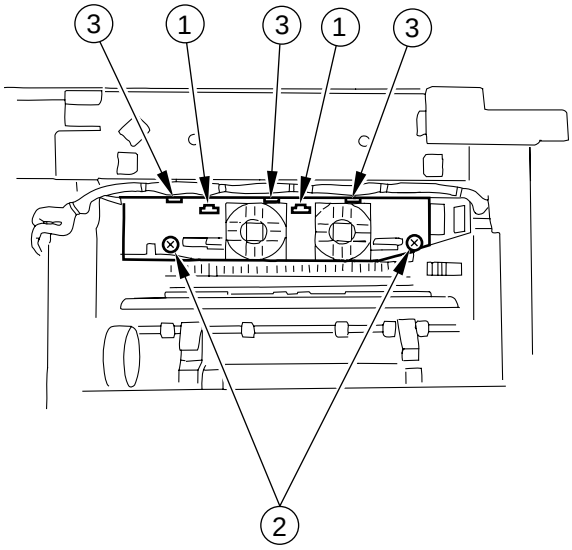

Figure 4-213

2. Scanner Cooling Fan

1) Remove the four screws, and remove the rear cover.
2) Disconnect the connector ①, and remove the tie-wrap; then, disengage the two hooks ② (left, right), and remove the scanner cooling fan ③.

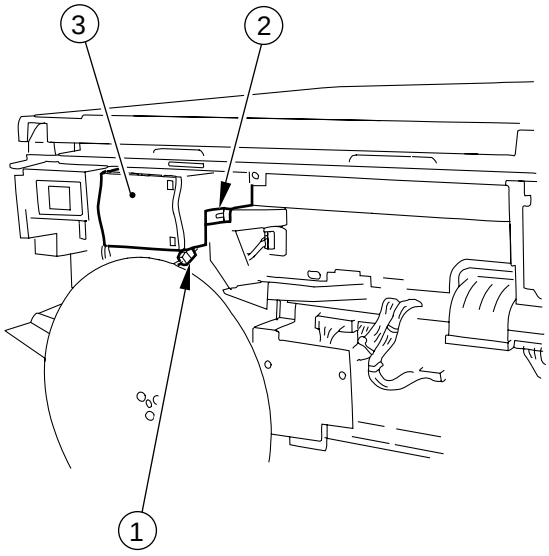

Figure 4-214

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III. DRIVE ASSEMBLY

A. Scanner Drive Assembly

1. Removing the Scanner Drive Motor

1) Remove the four screws, and remove the rear cover.
2) Remove the three screws, and remove the fly-wheel.
3) Remove the four screws ② and the spring ③; then, remove the scanner drive motor ①.

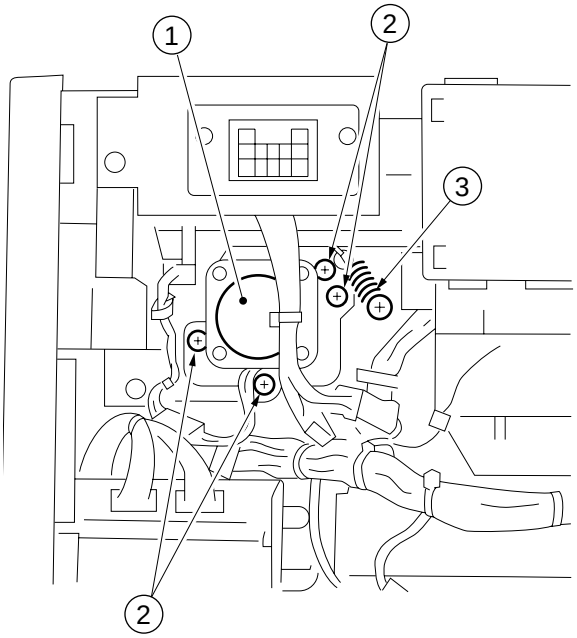

Figure 4-301

2. Removing the Scanner Cable

1) Remove the following:
   - Copyboard glass
   - Control panel
   - Rear cover, upper rear cover, right cover, left cover
2) Remove the metal fixings ① (front, rear) of the scanner cable.

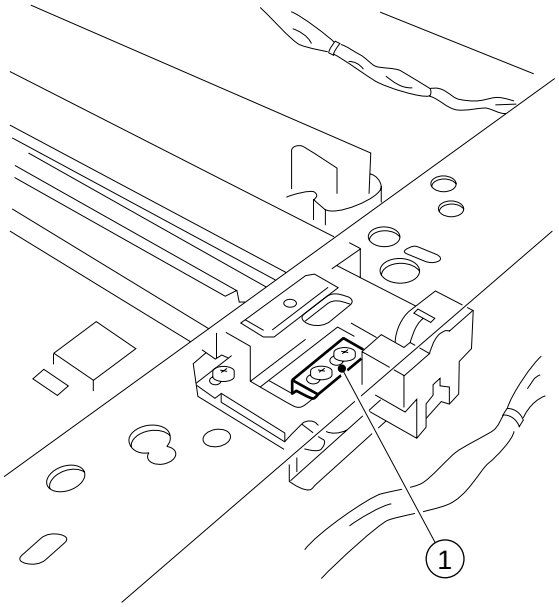

Figure 4-302

3) Remove the two screws ③, and release the cable spring stay ② (front, rear).

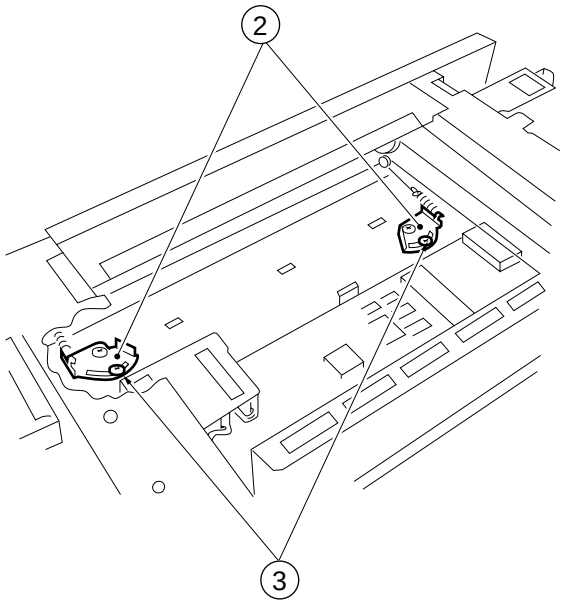

Figure 4-303

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4) Loosen the set screw ④, and remove the cable (front, rear).

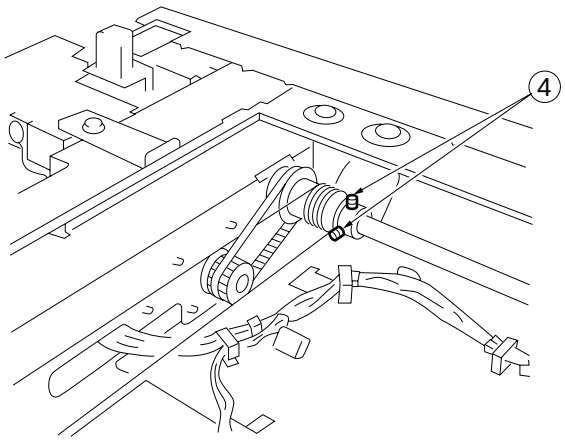

Figure 4-304

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3. Routing the Scanner Cable

Note:
You need the following tools when routing the scanner cable:
1. Mirror positioning tool (FY9-3009-040)
2. Pulley click(FY9-3010-000

Work in the order indicated in Figure 4-305.

1) Put the steel ball into the pulley hole ①, and wind the cable 3.5 times toward the inside and 6 times toward the outside (both front and rear).
2) Fix the cable in place with the pulley click.
3) Set the mirror positioning tool ②. (Se p. 4-11.)
4) Set the cable as shown ③, ④, ⑤, ⑥.
5) Loosen and then tighten the set screw ⑦ of the drive pulley so that the tension of the scanner cables is even throughout.
6) Fix the No. 1 mirror mount and the scanner cable metal fixing in place ⑧.
7) Fix the cable spring stay in place so that the spring length is 32 ±1 mm ⑨.

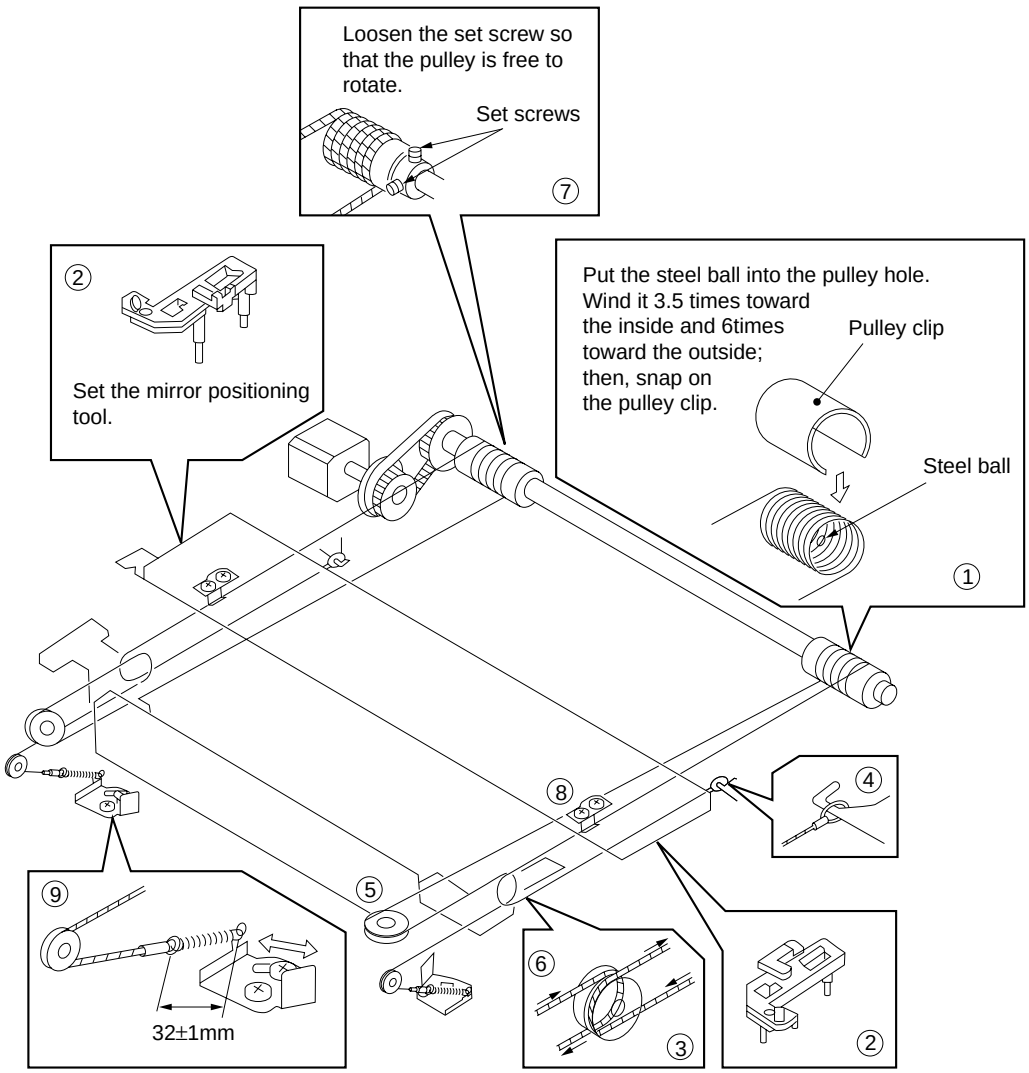

Figure 4-305

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4. Setting the Mirror Positioning Tool

Use the mirror positioning tool FY9-3009-040 by changing its pin arrangement for the machine.

Refer to the figures for the correct order; ①, ②, and ③ indicate the positions of the pins and Ⓐ, Ⓑ, and Ⓒ indicate the pins.

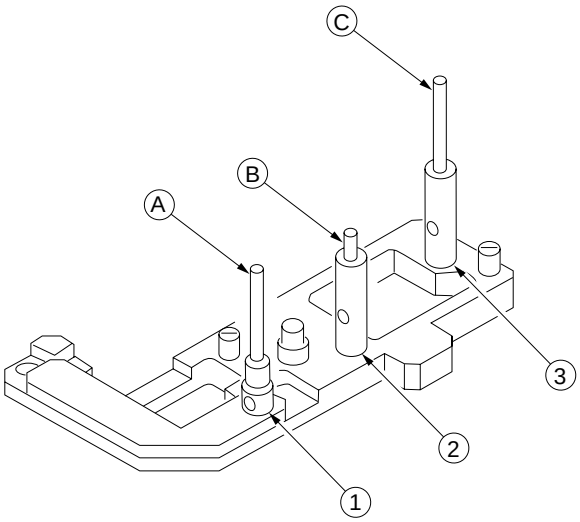

Figure 4-306 (FY9-3009-040)

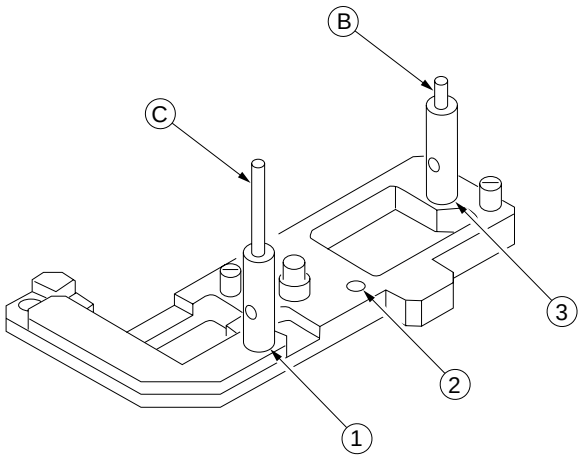

Figure 4-307
(arranged for the front of the machine)

1) Relocate the pins of the mirror positioning tool so that it may be used for the machine.

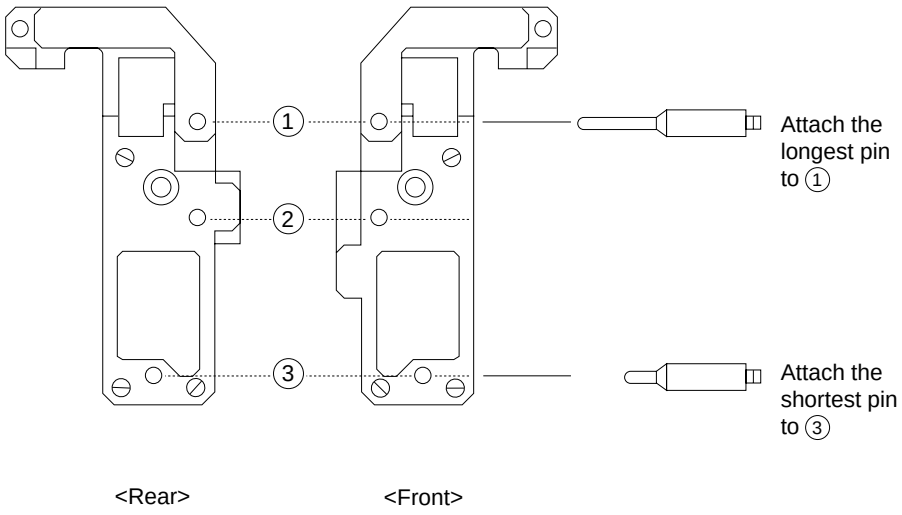

Figure 4-308

Note:
The pin Ⓐ of the mirror positioning tool (FY9-3009-040) will not be used for the machine.

5. Adjusting the Position of the Mirror (optical length of No. 1 mirror and No. 2/No. 3 mirror)

1) Prepare the mirror positioning tool.
2) Move the No. 1 mirror mount in the forward direction to match the hole in the front upper side plate and the hole in the slide assembly of the No. 1 mirror mount and the No. 2 mirror mount. (Do the same for the rear side plate.)
3) Set the mirror positioning tool to the No. 1 mirror mount and the No. 2 mirror mount (both front and rear).

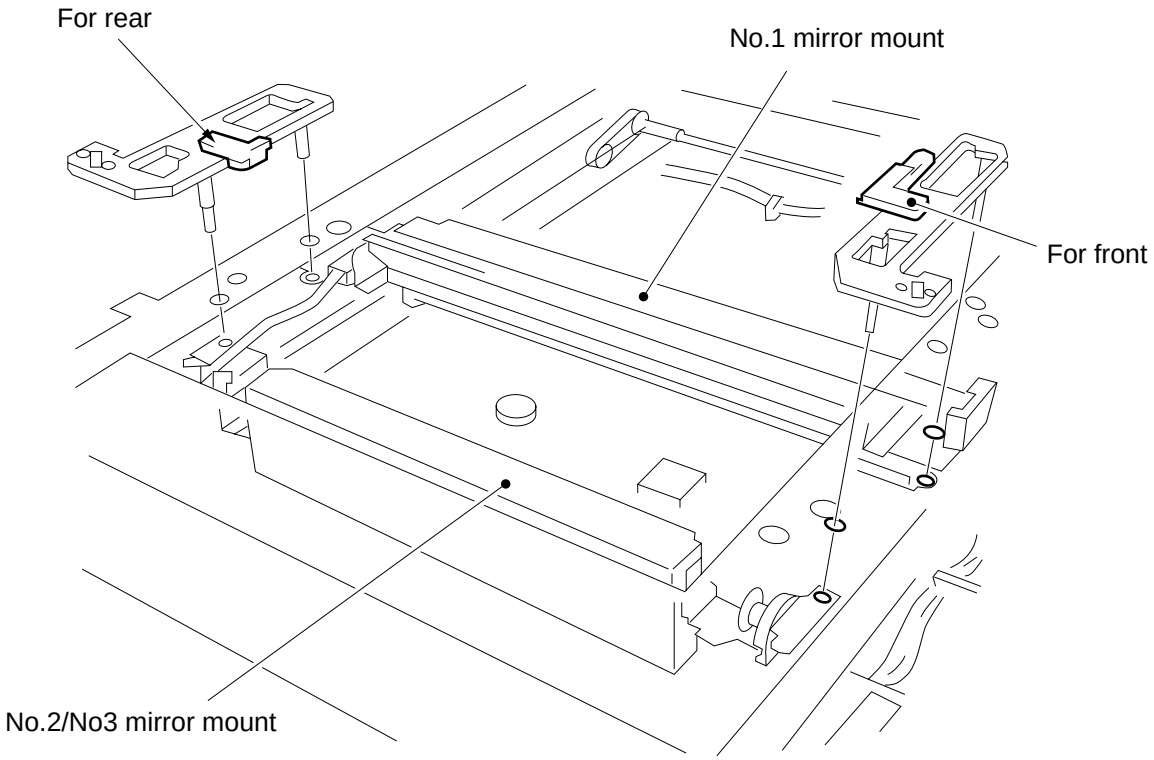

Figure 4-309

4) Tighten the set screw of the pulley.
5) Remove the tool.

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B. Fixing Drive Assembly

1. Removing the Fixing Drive Assembly

1) Disconnect the power plug.
2) Remove the four screws, and remove the rear cover.
3) Remove the three screws, and remove the flywheel.
4) Remove the two screws, and disconnect all connectors; then, remove the DC controller PCB.
5) Release the tension spring ②, and remove the fixing drive belt.

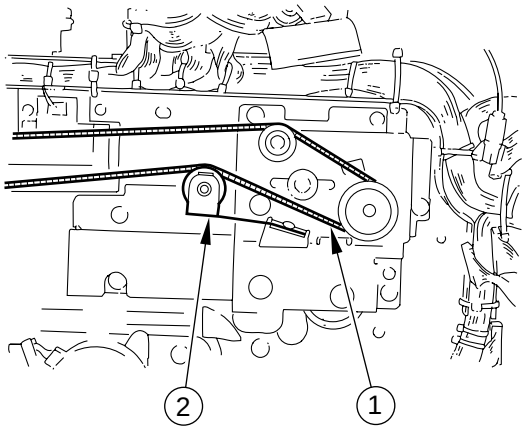

Figure 4-310

5) Remove the two screws, and remove the connector mount ③ found at the lower right of the rear of the copier.
6) Remove the two screws ⑤, and disconnect all connectors; then, remove the composite power supply PCB.

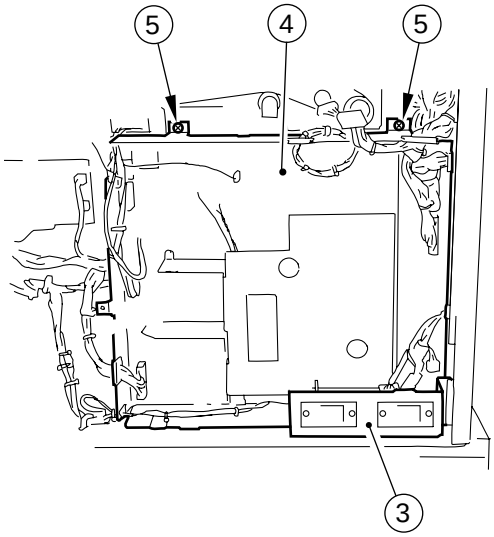

Figure 4-311

7) Remove the seven screws ⑦, and remove the fixing drive assembly ⑥.

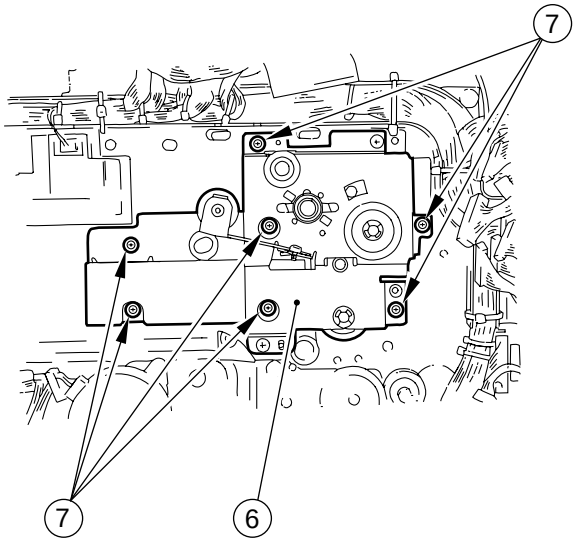

Figure 4-312

C. Duplexing Unit Inlet Motor Mount Assembly

1. Removing the Duplexing Inlet Motor Mount Assembly

1) Disconnect the power plug, and remove the following:
   - Rear cover (4 screws)
   - Flywheel (3 screws)
   - Connector mount
   - DC controller PCB (2 screws, all connectors)
   - Composite power supply PCB (2 screws, all connectors)
2) Remove two screws ②, and disconnect the connector ③; then, remove the duplexing unit inlet motor ①.

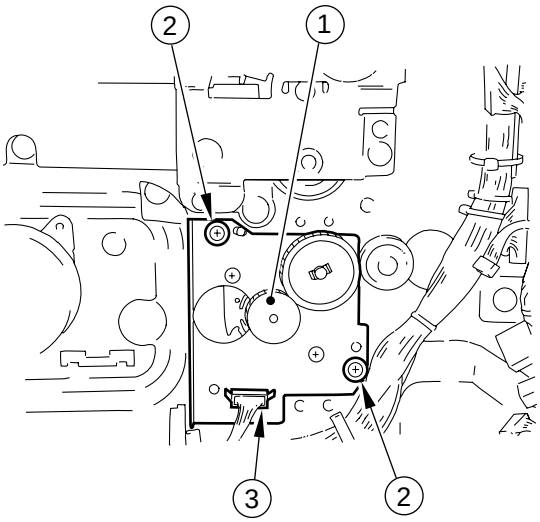

Figure 4-313

D. Set-Back Roller Motor Assembly

1. Removing the Set-Back Roller Motor Assembly

1) Disconnect the power plug, and remove the following:
   - Rear cover (4 screws)
   - Flywheel (3 screws)
   - Connector mount
   - DC controller PCB (2 screws, all connectors)
   - Composite power supply PCB (2 screws, all connectors)
2) Remove the three screws ②, and disconnect the two connectors ③; then, remove the set-back roller motor assembly ①.

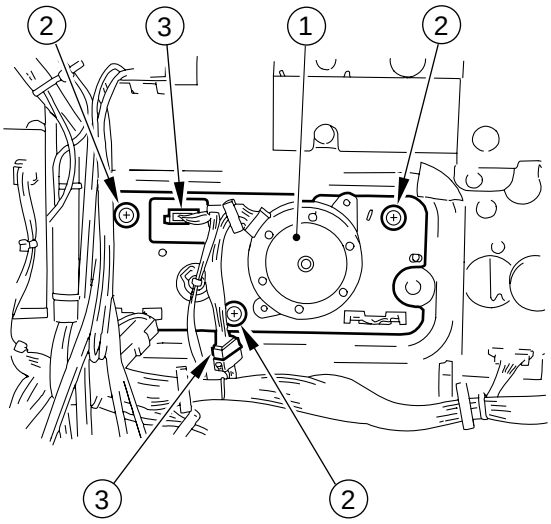

Figure 4-314

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E. Pick-Up Drive Assembly

1. Removing the Main Motor

1) Disconnect the power plug, and remove the following:
   - Rear cover (4 screws)
   - Flywheel (3 screws)
2) Remove the four screws ②, and disconnect the two connectors ③; then, remove the main motor ①.

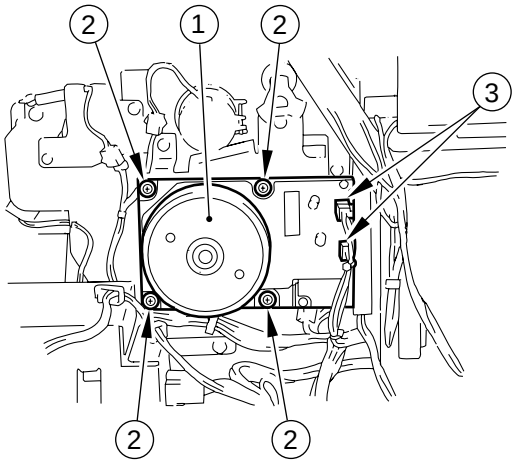

Figure 4-315

2. Removing the Pick-Up drive Unit

1) Disconnect the power plug, and remove the following:
   - Rear cover (4 screws)
   - Flywheel (3 screws)
   - Scanner cooling fan (hook, connector)
2) Remove the pick-up unit. (See p. 4-13.)
3) Release the belt ①.

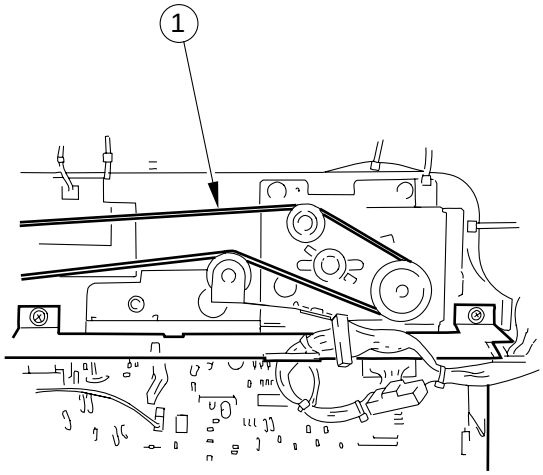

Figure 4-316

4) Remove the harness retainer ②, two high-voltage cable ③, and power supply cord mount ④ (2 screws).

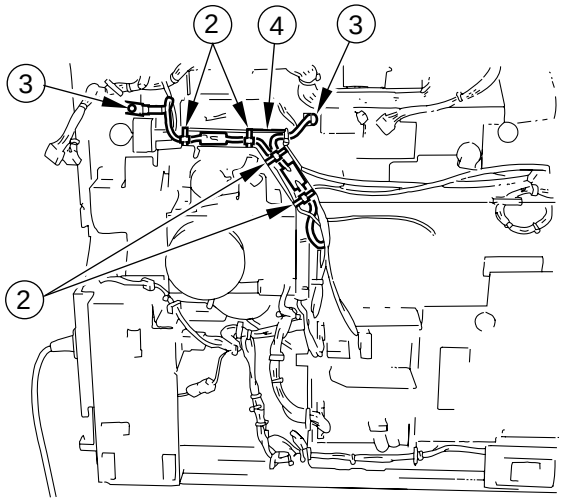

Figure 4-317

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5) Disconnect the seven connectors ⑤.
6) Remove the registration roller clutch ⑥.
7) Remove the four screws ⑧, and remove the pick-up drive unit.

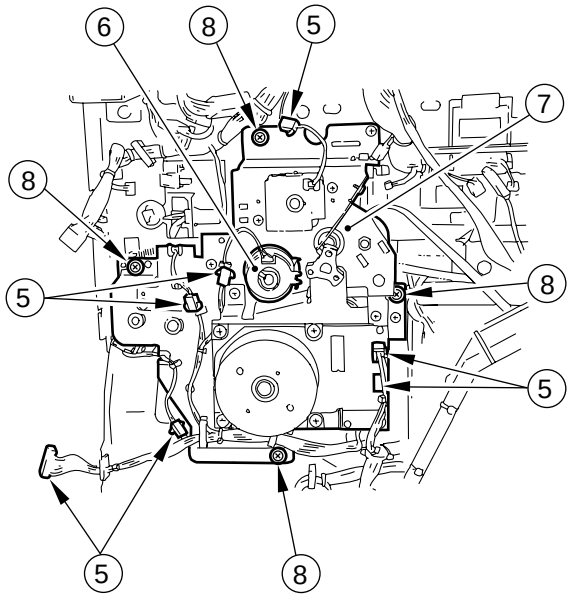

Figure 4-318

3. Vertical Path Assembly

1) Remove the following:
   - Pick-up unit (p. 4-18)
   - Pick-up drive unit (p. 4-15)
2) Remove the two rolls, and disconnect the connector; then, remove the multifeeder assembly.
3) Remove the two screws ① from behind the machine.

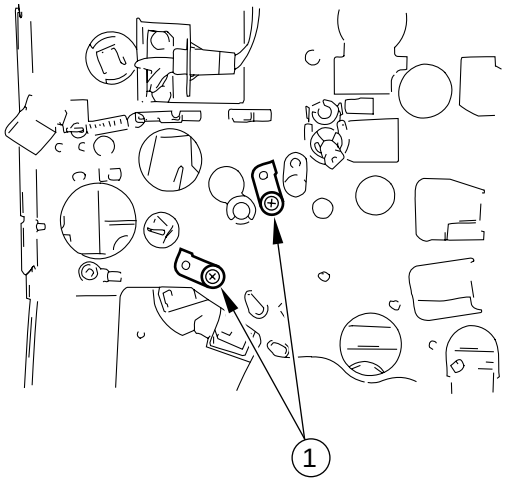

Figure 4-319

4) Release the feeding lever, and remove the three screws to remove the feeding lever and the feeding assembly locking assembly.
5) Remove the screw ②, grounding screw ③, and E-ring ④.

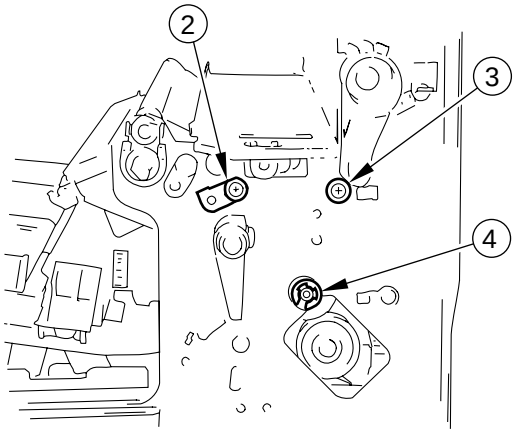

Figure 4-320

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6) Disconnect the connector ⑥, and remove the vertical path assembly.

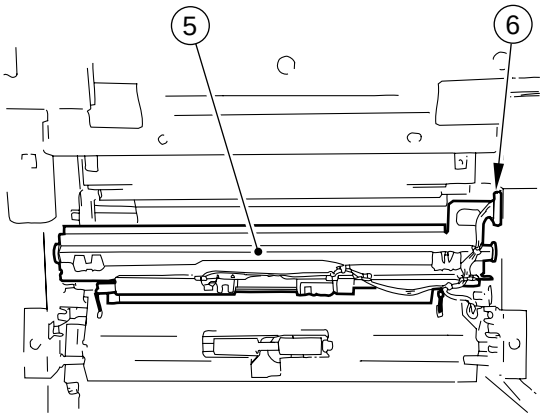

Figure 4-321

4. Horizontal Registration Motor

1) Remove the following:
   - Pick-up unit (p. 4-18)
   - Pick-up drive unit (p. 4-15)
   - Vertical path unit (p. 4-16)
2) Remove the two screws ②, and disconnect the two connectors ③; then, remove the horizontal registration motor ①.

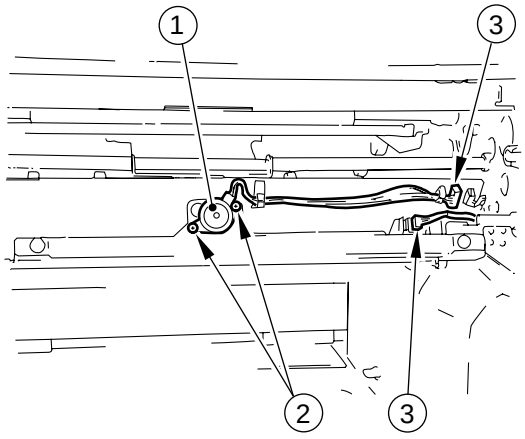

Figure 4-322

5. Developing Clutch

1) Remove the rear cover (4 screws), flywheel (3 screws), and harness retainer (high-voltage cord).
2) Remove the two screws, and disconnect the connector ③; then, remove the developing clutch.

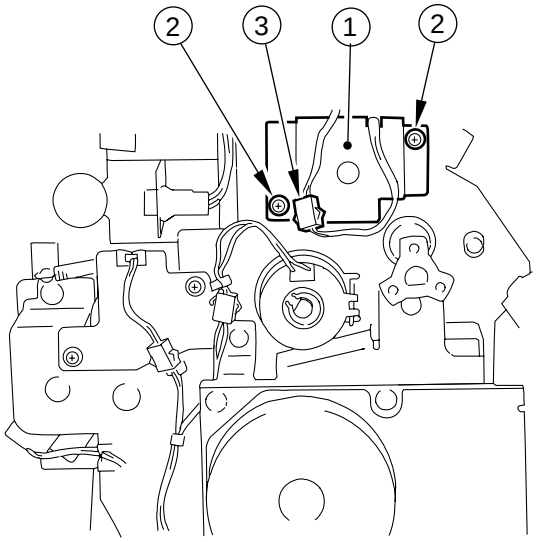

Figure 4-323

6. Multi Clutch

1) Remove the rear cover (4 screws) and the flywheel (3 screws).
2) Remove the two screws ②, and disconnect the connector ③; then, remove the multi clutch.

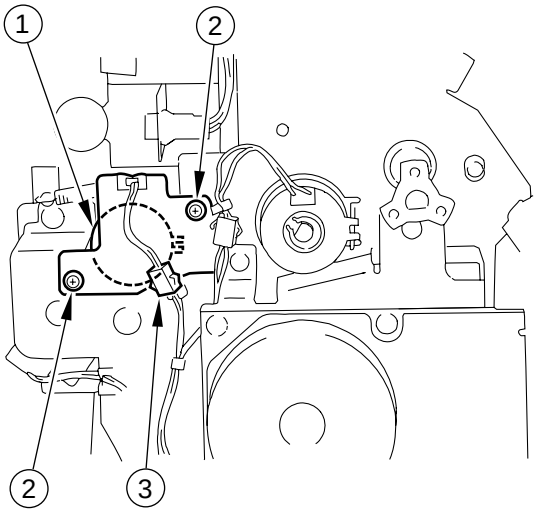

Figure 4-324

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IV. PICK-UP ASSEMBLY

A. Pick-Up Assembly

1. Removing the Pick-Up Assembly

1) Remove the cassette from the copier.
2) Remove the right cover.
3) Pull off the roll ① of the multi tray cover.
4) Detach the cable of the right door ② from the hook ③; then, remove the right door.

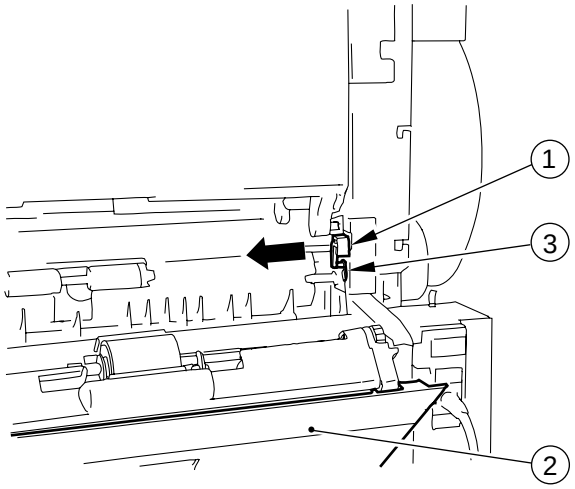

Figure 4-401

5) Disconnect the connector ④ of the pick-up assembly, and remove the grounding screw ⑤.
6) Remove the four screws ⑦, and remove the pick-up assembly ⑥.

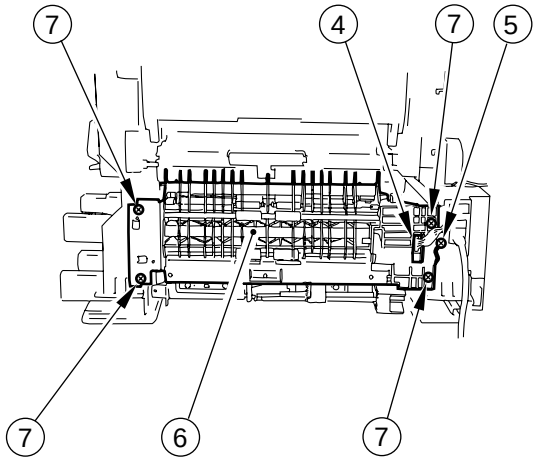

Figure 4-402

2. Removing the Pick-Up/Feeding/Separation Roller

1) Slide out the cassette.
2) Holding the knob assembly ①, pull it off in the axial direction.

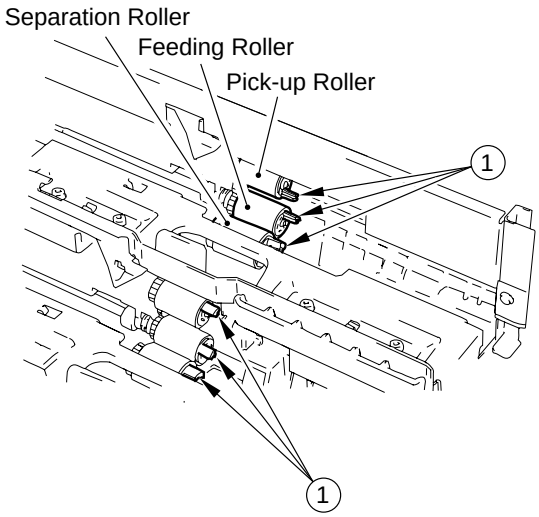

Figure 4-403

3. Installing the Pick-UP/Feeding/Separation Roller

1) Holding the knob assembly, push it in until a click is heard.

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4. Adjusting the Registration in Rear/Front Direction

Check to make sure that the margin along the image front is 2.5 ±1.5 mm on copies. (Try all cassettes.)

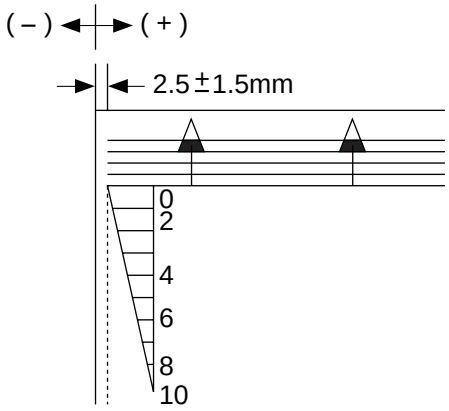


Figure 4-404

If the margin is not as indicated, perform the following:

1) Slide out the cassette from the holder to be adjusted.
2) Remove the two screws ②, and remove the horizontal registration mount ①.

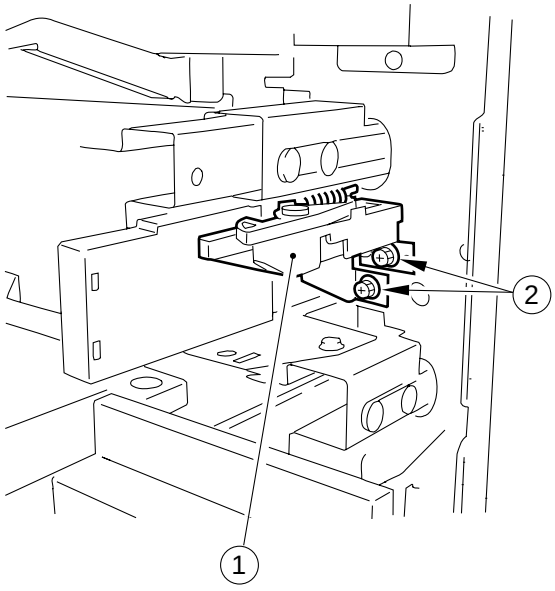


Figure 4-405

3) Loosen the hex screw, and move the horizontal registration plate to the rear front so that the width is as specified.

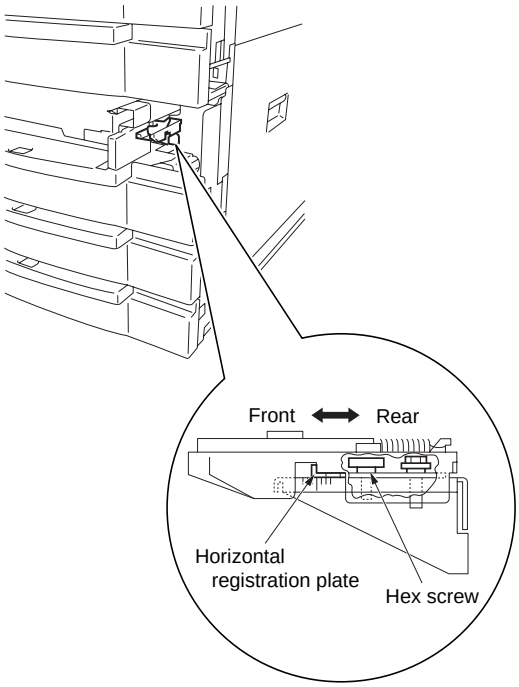
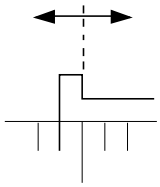


Figure 4-406

Note:
Adjust the horizontal registration plate by matching the inner side of the L shape on the horizontal plate is at a specific scale notch.



B. Multifeeder Assembly

1. Removing the Multifeeder Unit

1) Open the multifeeder assembly ①, and insert a large flat-blade screwdriver into the top ② of the connector cover, and turn it to remove the cover; then, disconnect the connector.

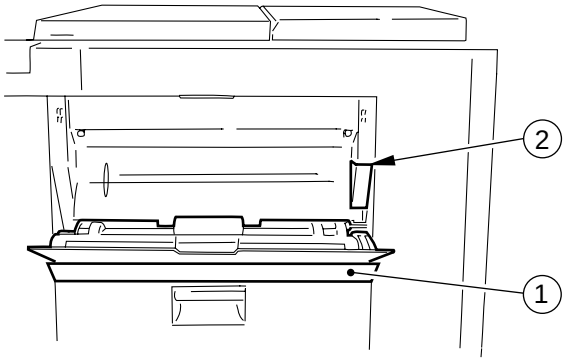


Figure 4-407

2) Close the multifeeder assembly, and open the right door; then, pull out the rolls ③ from the left and the right.

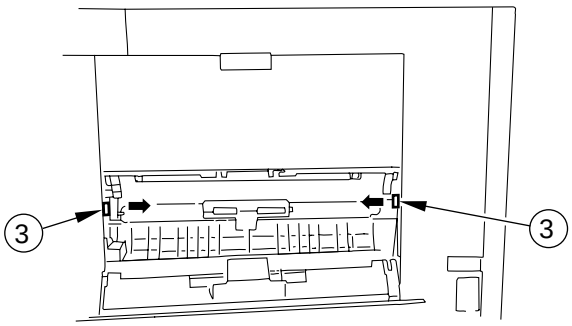


Figure 4-408

3) Remove the multifeeder assembly.

Reference:
When installing the multifeeder connector cover, match the top first and push the bottom in.

2. Removing the Multifeeder Pick-Up Roller

1) Pull out the multifeeder rolls.
2) Detach the cable from the cable, and remove the right door ①.

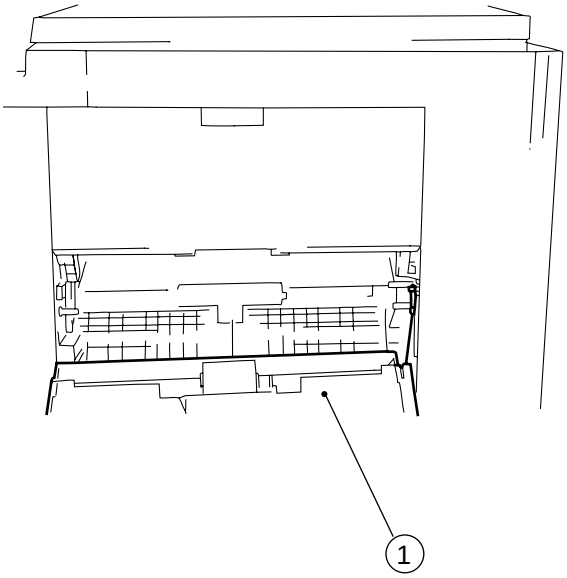


Figure 4-409

3) Remove the snap-on bushing ②, and shift the roller shaft ③ in the direction of the arrow.
4) Remove the stop ring ④, and remove the multifeeder pick-up roller ⑤.

Caution:
Work carefully while paying attention to the pin at the rear of the pick-up roller.

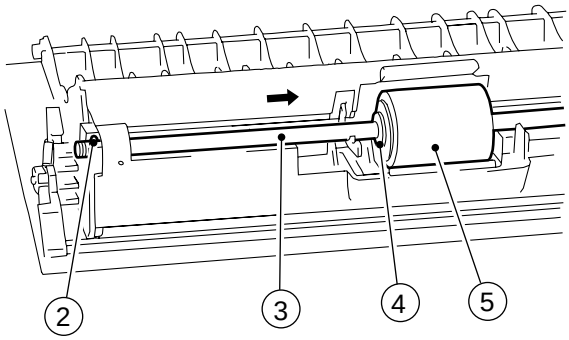


Figure 4-410

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3. Removing the Separation Pad

1) Remove the right door.
2) Remove the multifeeder pick-up roller.
3) While pushing the end ① of the right door in the direction of A, remove the rear of the separation pad cover ② in the direction of B.

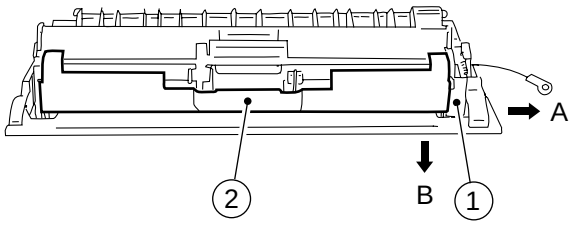

Figure 4-411

4) Remove the separation pad retaining plate ③ by releasing the hook ④.

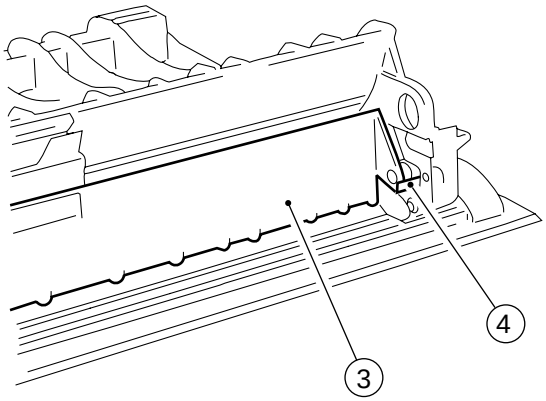

Figure 4-412

C. Feeding Assembly

1. Removing the Feeding Assembly

1) Open the front door, and remove the fixing inside cover; then, remove the fixing unit. (4 connectors, 1 screw, 1 grounding screw)
2) Remove the drum unit.
3) Disconnect the connector ①, and remove the grounding screw ②.
4) Remove the screw, and remove the feeding assembly positioning pin ③; then, remove the feeding assembly ④ from the front.

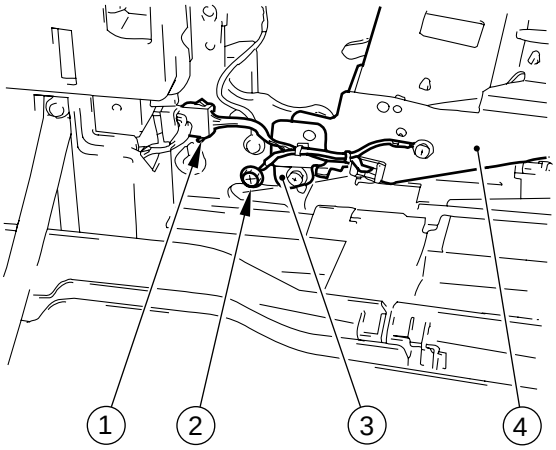

Figure 4-413

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2. Removing the Feeding Fan

1) Remove the feeding assembly.
2) Remove the screw, and remove the transfer charging roller unit from the feeding assembly.
3) Remove the three bushing ① and the gear ② by disengaging the hooks.
4) Remove the screw, and remove the static eliminator ③.
5) Remove the feeding fan assembly ④ from the mount in the direction of the arrow.

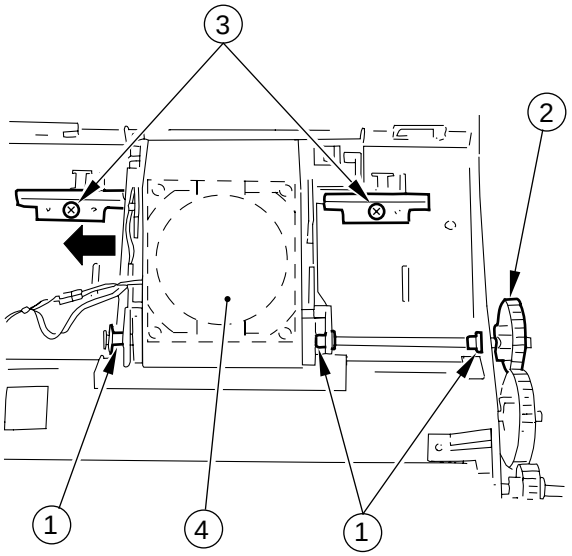

Figure 4-414

6) Disconnect the connector ⑤, and remove the feeding belt ⑥ as if to displace it.

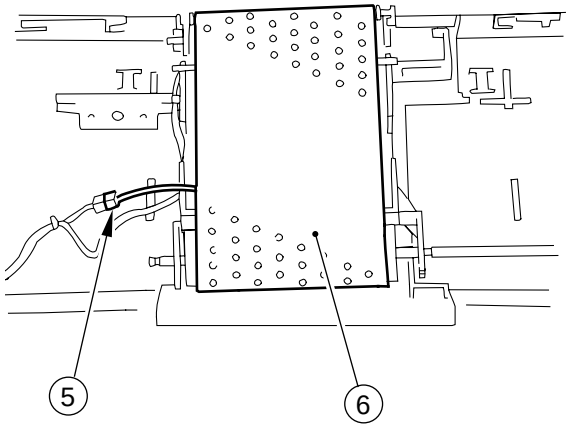

Figure 4-415

7) Release the hook assembly ⑧ of the feeding fan cover ⑦ with a small flat-blade screwdriver.
8) Remove the feeding fan ⑨.

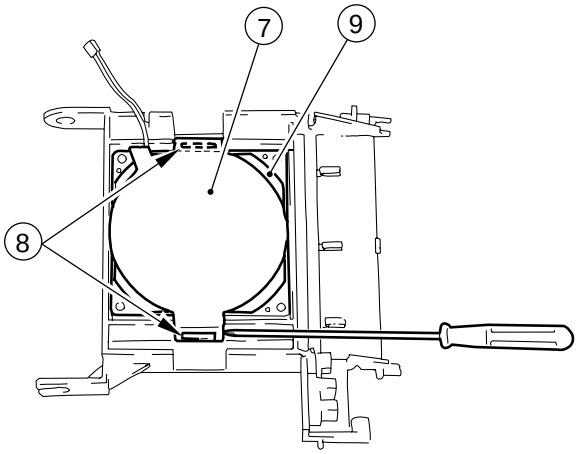

Figure 4-416

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D. Lower Feeding Assembly

1) Remove the inside cover and the pick-up mount.
2) Set the feeding assembly, i.e., lock it in place.
3) Remove the two screws ②, and remove the front door support (right) ①.

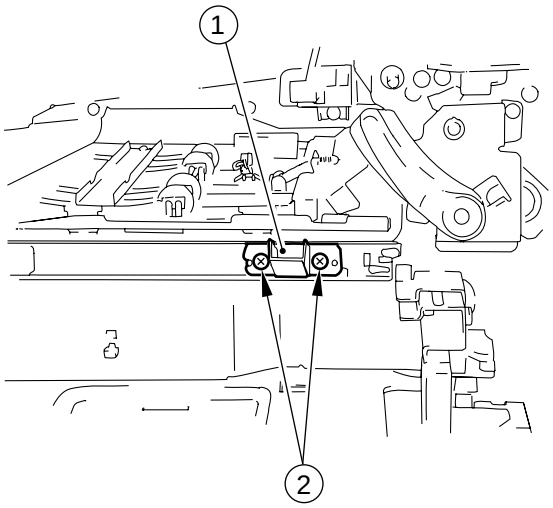

Figure 4-417

4) Remove the three screws ③, and remove the lower feeding assembly.
5) Disconnect the connector of the lower feeding assembly, and remove the lower feeding assembly.

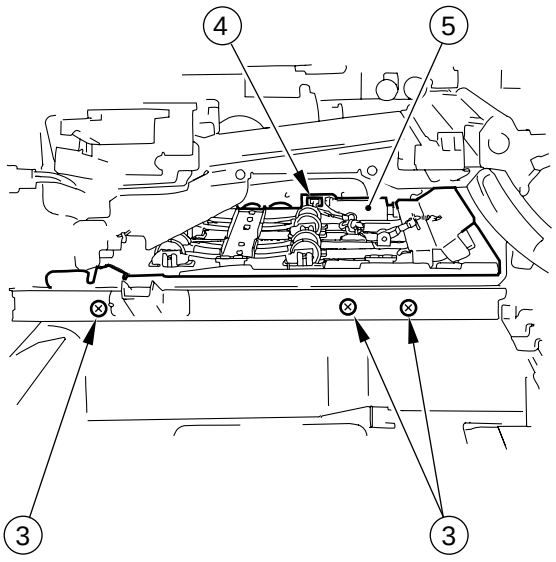

Figure 4-418

E. Registration Roller Assembly

1. Removing the Registration Roller

1) Remove the following:
   - DC controller PCB
   - harness guide
   - Power supply mount
   - Drive unit
   - Developing assembly
   - Drum unit
2) Remove the screw ①, spring ②, and two E-rings ③ from the rear of the machine.

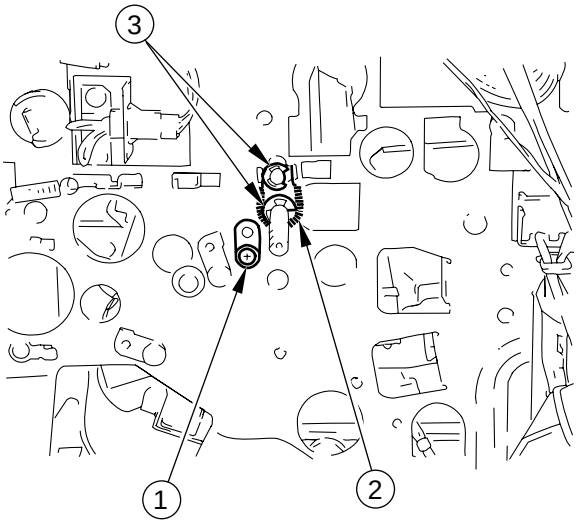

Figure 4-419

3) Remove the screw ④, spring ⑤, and two E-rings from the front of the machine.

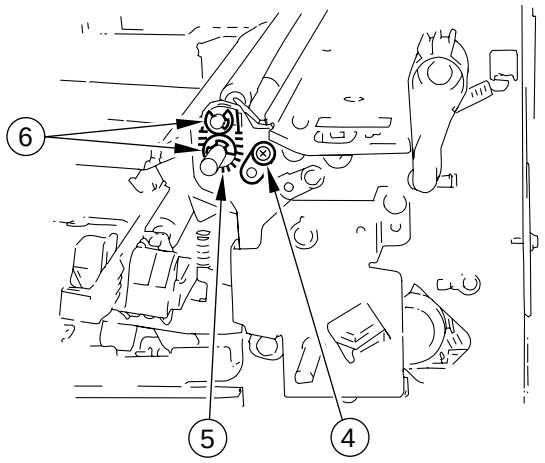

Figure 4-420

4) Remove the transfer guide unit.
5) Remove the registration roller.

F. Delivery Assembly

1. Removing the Delivery Assembly Lower Cover

1) Turn OFF the power, and disconnect the power supply.
2) Open the front cover.
3) Open the delivery assembly, and remove the delivery assembly connector cover. (Snap off the connector cover with a finger.)

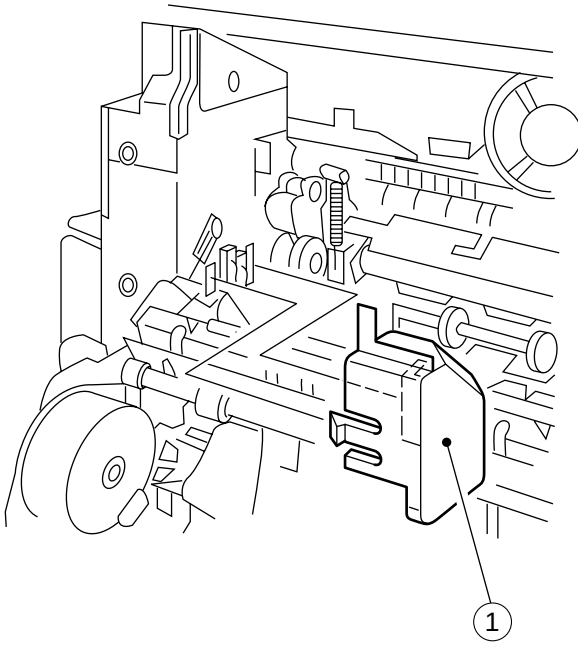

Figure 4-421

4) Disengage the hook ③ of the delivery assembly lower cover ②.

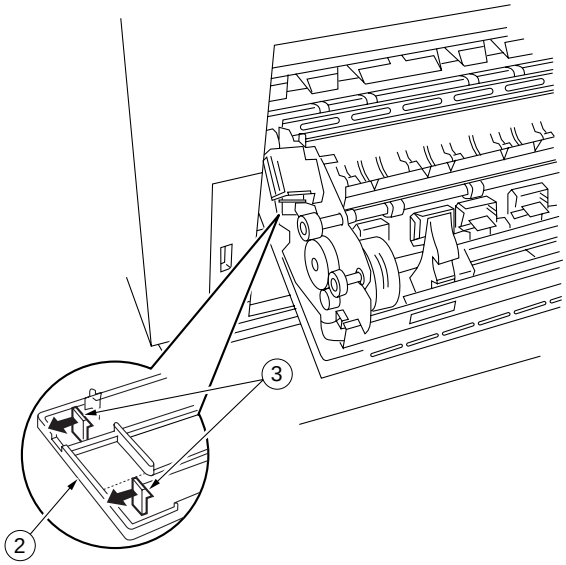

Figure 4-422

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5) Close the delivery assembly, and remove the delivery assembly lower cover.

Caution:
The delivery assembly lower cover cannot be removed unless the delivery assembly is closed. Be sure to close the delivery assembly after releasing the hook.

2. Removing the Delivery assembly

1) Disconnect the connector.
2) Open the delivery assembly, and remove the screw ② to remove the cable from the machine (rear, front).

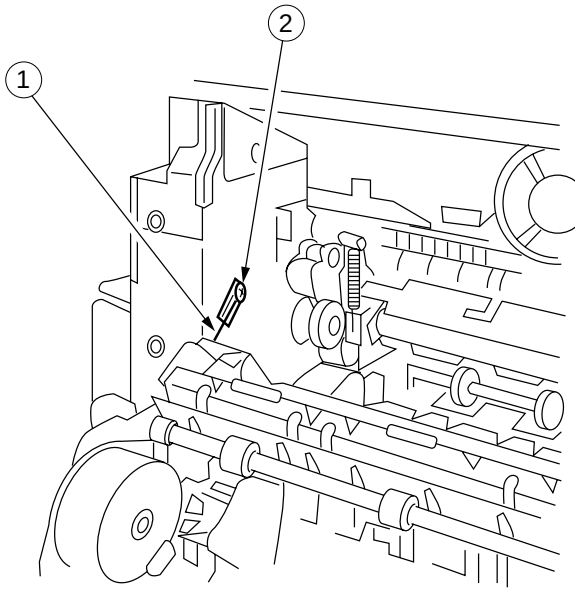

Figure 4-423

3) Pull out the spacer ① from the right side of the delivery assembly.

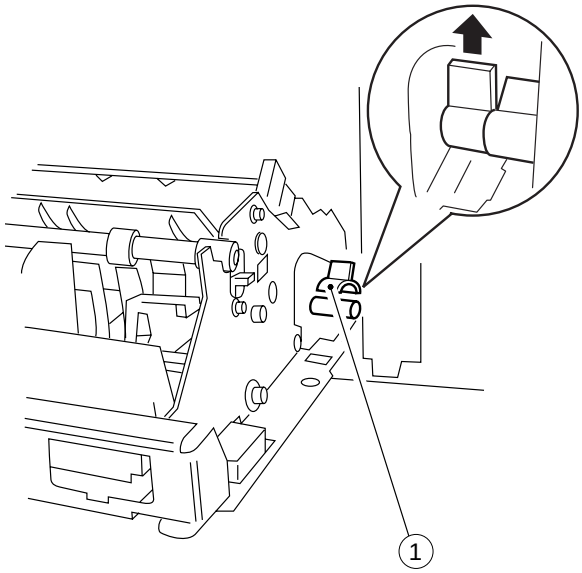

Figure 4-424

4) Release the bushing ① by shifting it to the left.

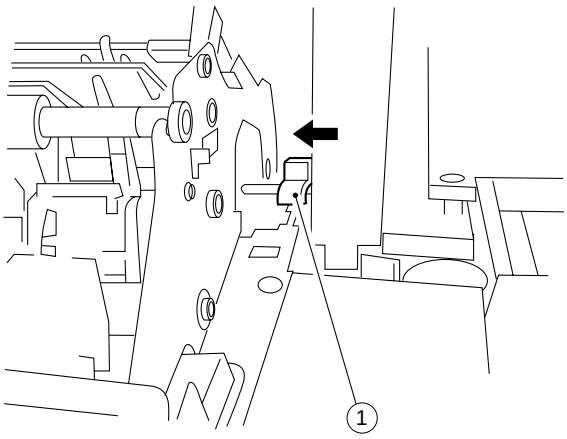

Figure 4-425

5) Move the delivery assembly to the right, and disengage its left and then its right to remove.

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3. Installing and Positioning the Paper Deflecting Plate 1 Solenoid (SL5)

1) Remove the delivery assembly.
2) Place the delivery assembly upright on a level surface (desk).
3) Push in the steel core of the paper deflecting plate 1 solenoid (SL5) until it stops.
4) Loosen the adjusting screw to adjust so that the gap between the steel core E-ring and the solenoid frame is about 0.2 mm.
5) Install the delivery assembly to end the adjustment.

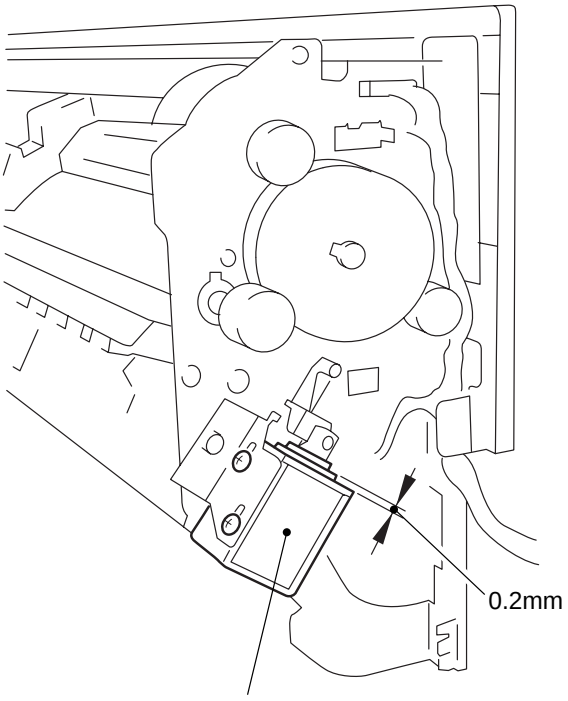

Figure 4-426

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V. EXPOSURE

A. Illuminating Assembly

1. Removing the Scanning Lamp

Caution:
1. Wait until the surface of the scanning lamp has cooled before starting the work.
2. Do not leave fingerprints on the surface of the scanning lamp (in particular, on the transparent side).
3. If the surface of the scanning lamp is soiled, dry wipe it.

1) Disconnect the power plug.
2) Remove the copyboard glass.

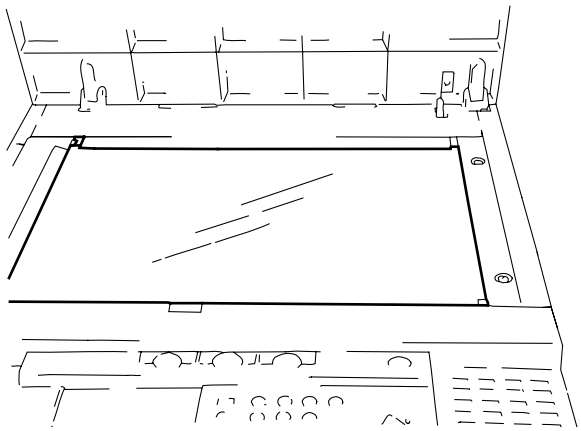

Figure 4-501

3) Remove the four screws, and remove the rear cover.
4) Remove the feeder unit or the copyboard cover; then, remove the two screws, and remove the upper rear cover.
5) Disconnect the connector, and disengage the hook assembly ③; then, remove the scanner cooling fan.

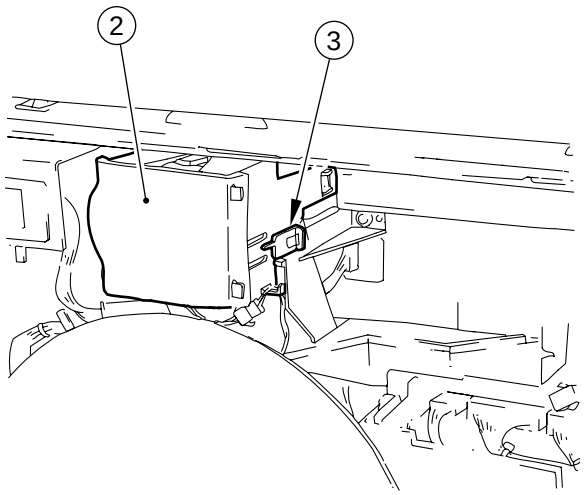

Figure 4-503

6) Move the No. 1 mirror mount so that it is as shown when viewed from the rear.
7) Remove the screw, and remove the fluorescent lamp cover ④; then, pull out the scanning lamp.

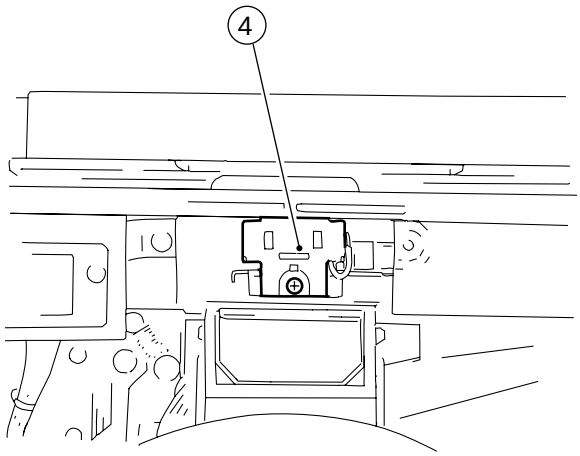

Figure 4-504

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Caution:
The scanning lamp has its own orientation. Observe the following when installing it:
1. Make sure that the manufacturer's name is toward the rear of the machine.
2. Keep the transparent side of the lamp toward the reflecting plate.
3. Do not touch the transparent side of the lamp.

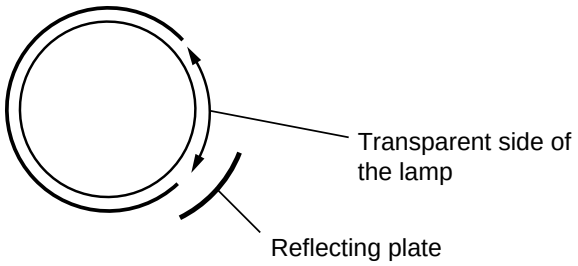

Figure 4-505

8) Execute 'R&D SHADING' (12th screen) in service mode (*3*; ADJUST). (shading for R&D and factory)

B. CCD Unit

1. Removing the CCD Unit

1) Disconnect the power plug.
2) Remove the copyboard glass.
3) Remove the CCD unit cover ①.

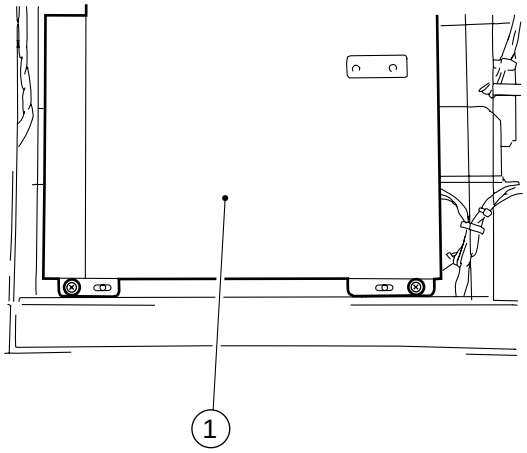

Figure 4-506

4) Remove the screw, and remove the original size sensor ② to keep it away from the CCD unit.

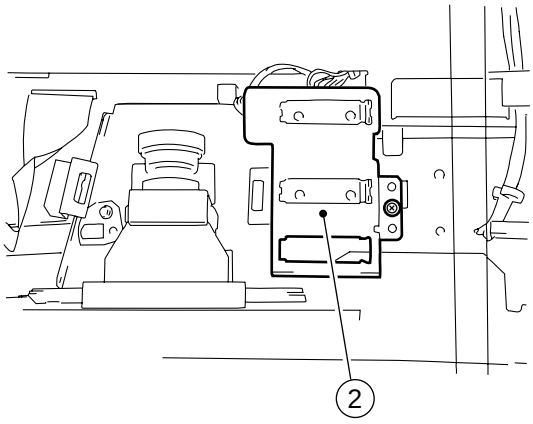

Figure 4-507

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5) Remove the screw, and remove the CCD unit retaining spring ③; disconnect the connector ④, and pull off the flat cable ⑤ to remove the CCD unit.

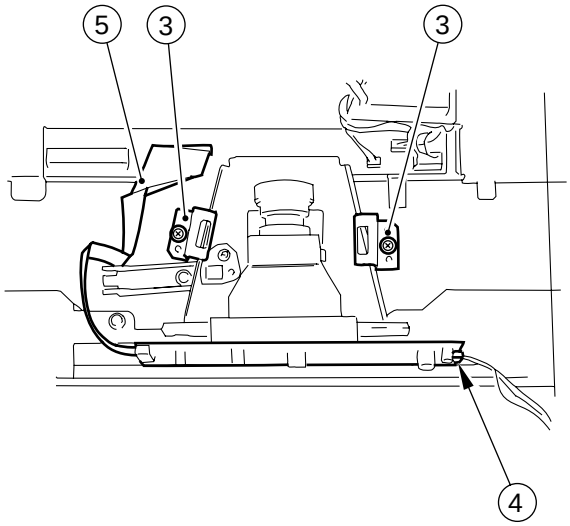

Figure 4-508

Caution:
Do not remove any paint-locked screws.
Particularly, never remove the screw ⑥.

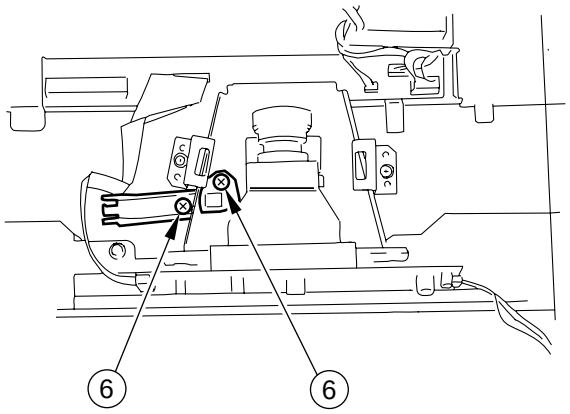

Figure 4-509

C. IPU PCB

1. Removing the IP PCB

1) Remove the copyboard glass, and remove the CCD unit cover.
2) Return the No. 1 mirror mount to home position.
3) Remove the four screws ②, and move the IP cover ① to the front; then, remove it while lifting its rear first.

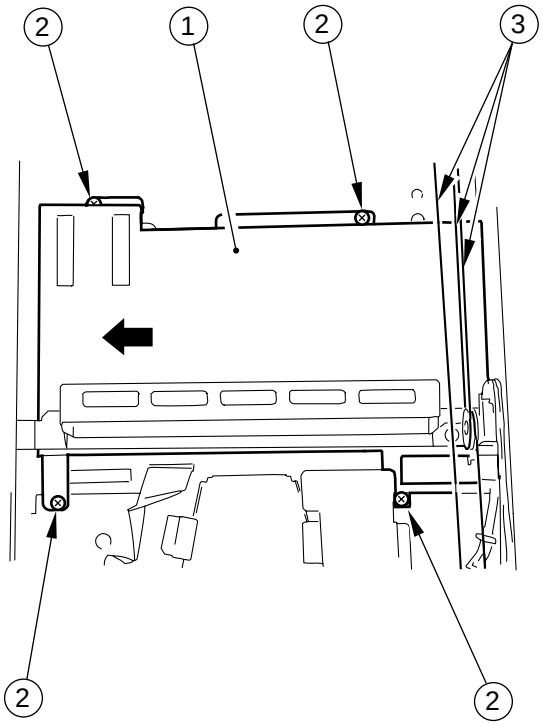

Figure 4-510

4) Remove the screw, an remove the original size sensor ④; then, remove the flat cable and all connectors to the IP PCB ⑤.

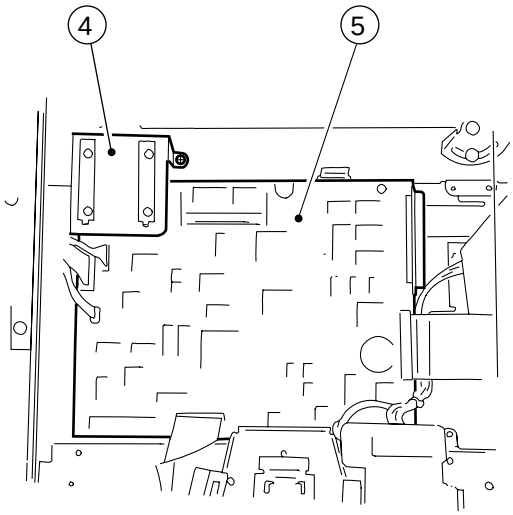

Figure 4-511

5) Remove the four screws, and remove the PI PCB.

D. Laser Scanner Assembly

1. Removing the Scanner Cooling Fan Duct 1

1) Remove the four screws, and remove the rear cover.
2) Remove the scanner cooling fan.
3) Remove the three screws, and remove the fly-wheel.
4) Remove the cable guide by disengaging the hook assembly.
5) Remove the two screws ②, and remove the scanner cooing fan duct 1 ① by sliding it to the left.

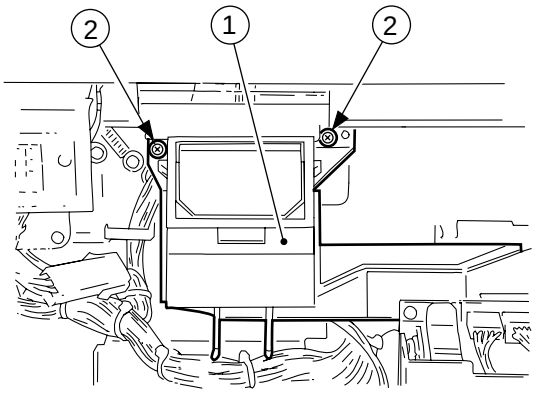

Figure 4-512

2. Removing the Laser Scanner Unit

1) Remove the rear cover, and remove the scanner cooling fan duct.
2) Remove the copyboard glass, CCD unit cover, IP cover, and IP PCB.
3) Remove the fan duct 2 ① by sliding it to the rear.

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4) Remove the cable guide ② and the hook assembly ③ by disengaging them.

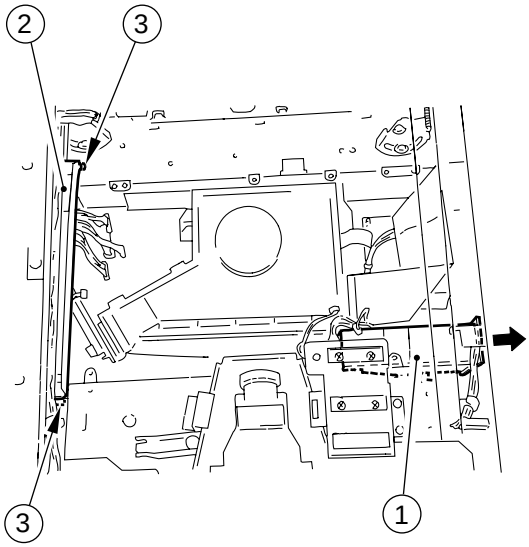

Figure 4-513

5) Remove the cable ④ and five screws ⑤, and disconnect the connector ⑥; then, remove the laser scanner unit ⑦.

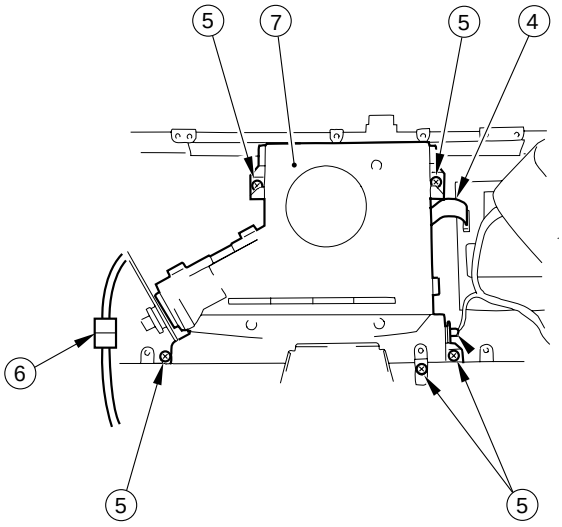

Figure 4-514

3. Removing the BD PCB

1) Remove the laser scanner unit.
2) Remove the two M2 screws, and remove the BD PCB ①.

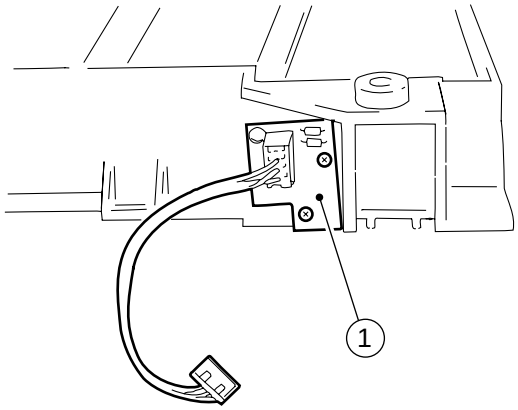

Figure 4-515

4. Laser Driver Unit

1) Remove the laser scanner unit.
2) Remove the two M3 screws ②, and remove the laser driver unit ①.

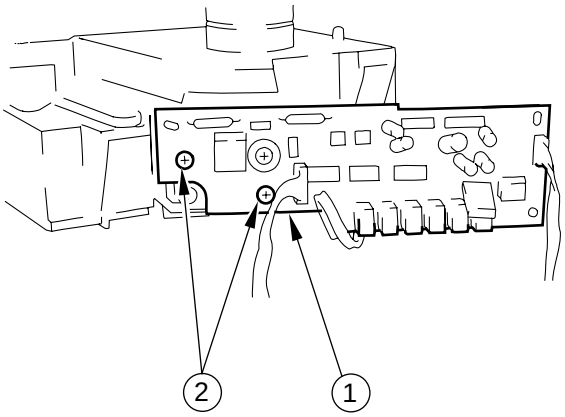

Figure 4-516

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VI. DEVELOPING SYSTEM

A. Developing Assembly

1. Removing the Developing Assembly

1) Open the front door.
2) Shift the developing assembly releasing lever ①, and remove the screw; then, remove the developing assembly stopper ②.

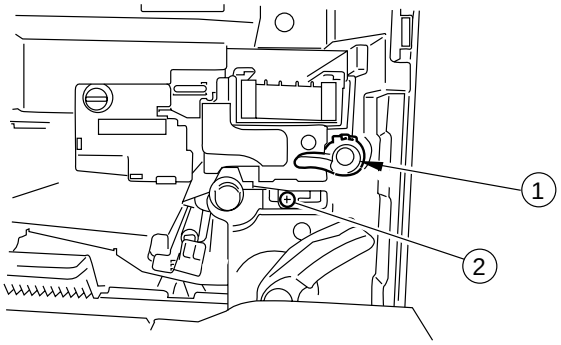

Figure 4-601

3) Holding the grip of the developing assembly, slide out the developing assembly to the front while supporting its bottom.

Caution:

1. Do not hold the developing assembly as if to sandwich the developing cylinder; otherwise, such can encourage caking of the toner.
2. After installing the developing assembly, be sure to install the developing assembly stopper.
3. The gap between the cylinder and the blade is adjusted at the factory to high precision. Do not try to adjust it in the field.

2. Removing the Toner Sensor

1) Slide out the developing unit.
2) Remove the screw ②, and disengage the hook ③; then, remove the grip ① of the developing assembly.

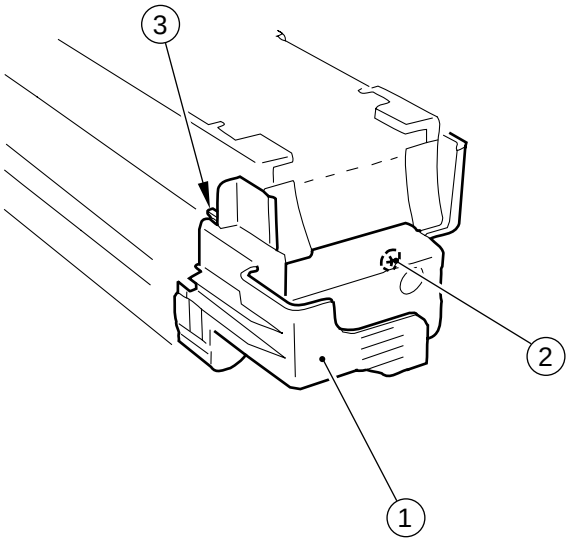

Figure 4-602

3) Remove the two screws ④, and disconnect the connector ⑤; then, remove the toner sensor.

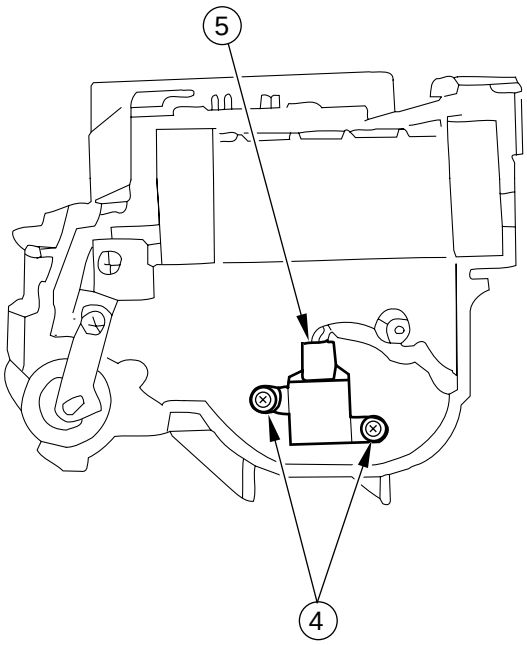

Figure 4-603

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3. Blade Mount

1) Remove the two screws 2, and disengage the four hooks 3; then, remove the developing assembly cover 1.

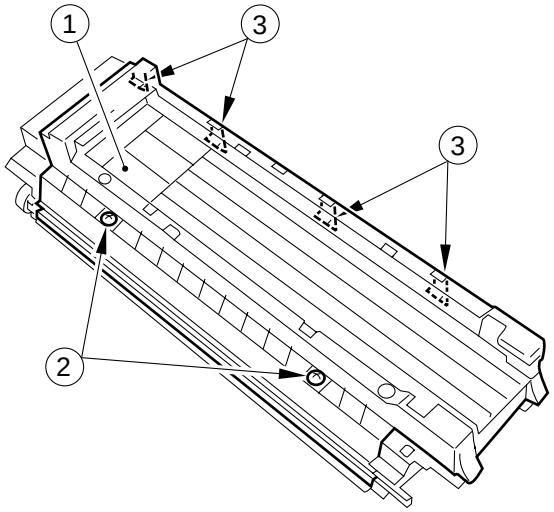

Figure 4-604

2) Remove the two screws, and remove the blade mount 4.

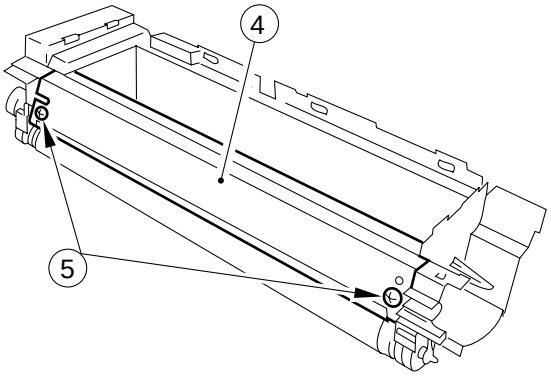

Figure 4-605

VII. FIXING SYSTEM

A. Fixing Assembly

1. Separation Claw

1) Open the delivery door.
2) Remove the screw ③, and remove the grip ② of the separation claw unit ①.
3) Remove the separation claw by sliding it to the right.

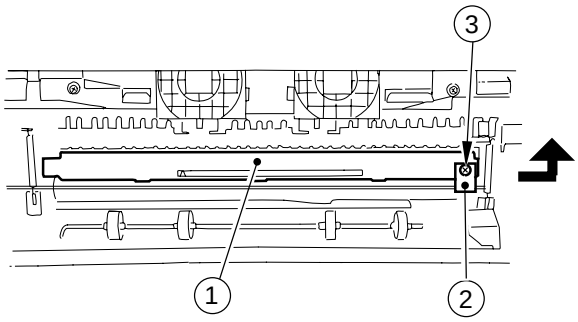

Figure 4-701

4) Turn the separation claw so that the boss ⑤ matches the bushing ⑥.

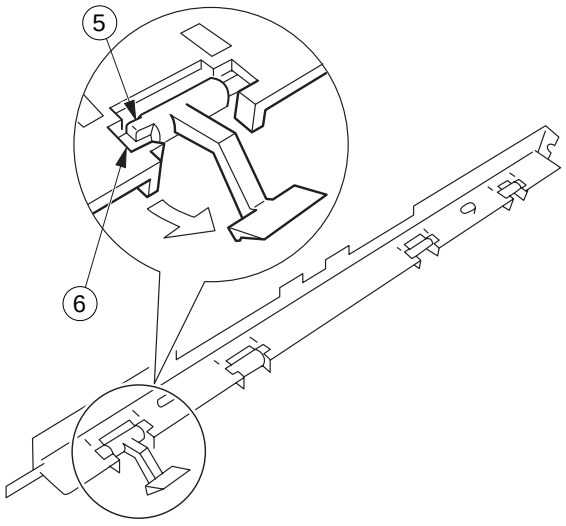

Figure 4-702

5) Slide the separation claw as shown, and remove it starting with the side without a boss.

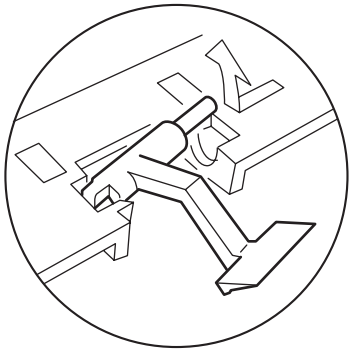

Figure 4-703

2. Removing the Fixing Unit

1) Open the delivery door.
2) Remove the screw, and remove the fixing assembly inside cover ①.

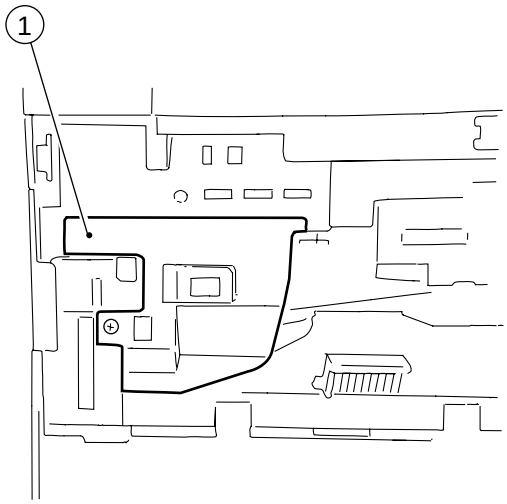

Figure 4-704

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3) Disconnect the four connectors ②, remove the screw ③, and remove the grounding screw ④; then, slide out the fixing unit.

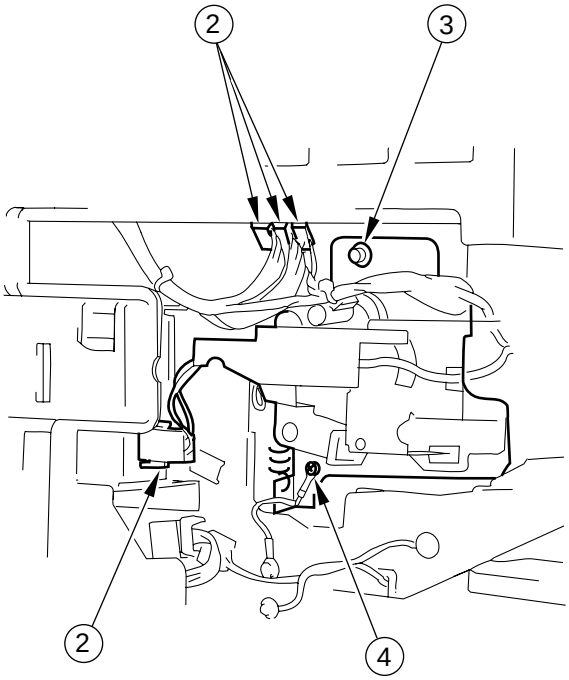

Figure 4-705

3. Removing the Upper Fixing Guide (fixing rear sensor)

1) Slide out the fixing unit.
2) Push the hook assembly ①, and slide the upper fixing guide ② to the rear to remove.

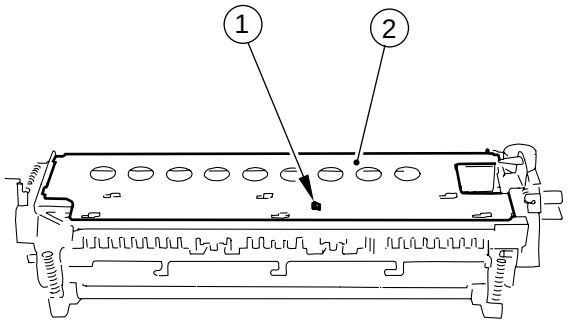

Figure 4-706

4. Removing the Cleaning Roller

1) Slide out the fixing unit.
2) Remove the two screws ①, and remove the cleaning roller ②.

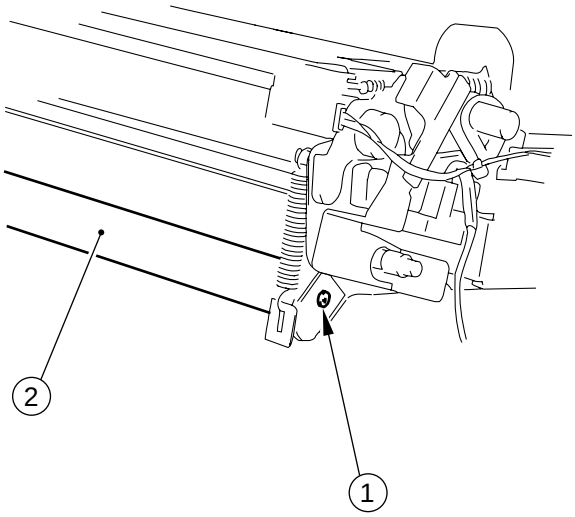

Figure 4-707

5. Removing the Lower Fixing Roller

1) Slide out the fixing unit.
2) Remove the releasing spring ①.

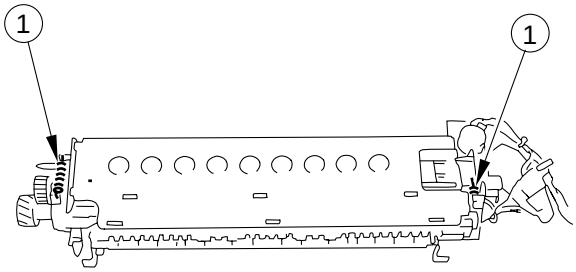

Figure 4-708

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3) Remove the E-ring ③, and remove the lever ② at the front.

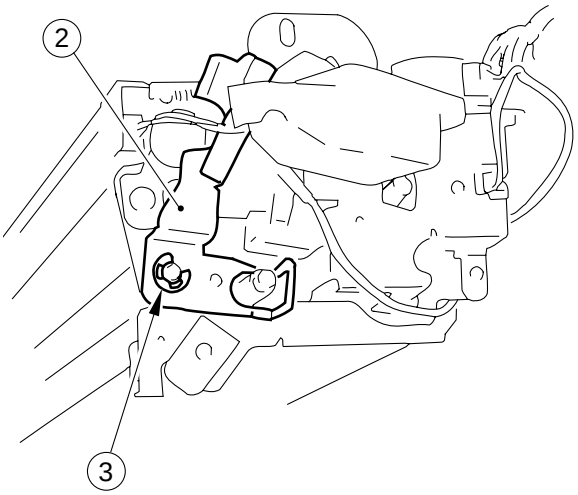

Figure 4-709

4) Remove the E-ring ⑥, and remove the lever ⑤ at the rear.

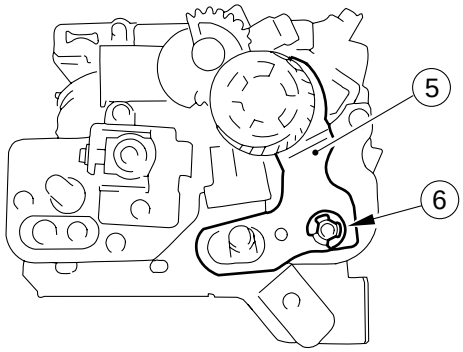

Figure 4-710

5) Remove the two locking springs ⑦.

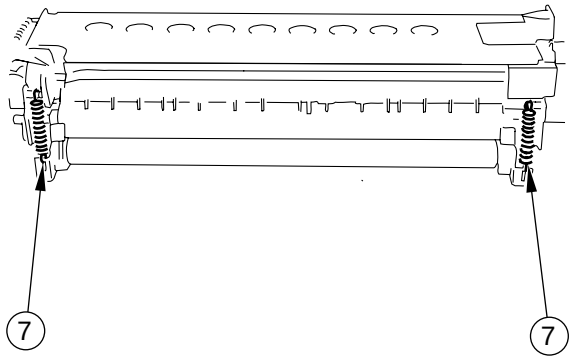

Figure 4-711

6) Remove the separation claw.
7) Remove the lower fixing roller.

Caution:

The lower fixing roller shaft is in contact with an electrode at the rear of the machine and has a rear/front orientation. Install it with care so that it is oriented correctly.

- Install it so that the side with a boss of the lower fixing roller is toward the rear of the machine.

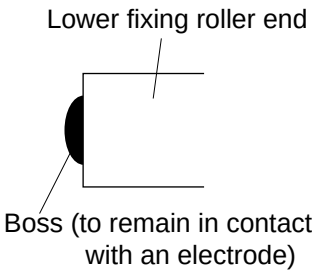

Figure 4-712 Rear of the Shaft End (electrode side)

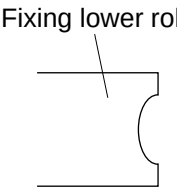

Figure 4-713 (front of shaft end)

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VIII. ELECTRICAL SYSTEM

A. DC Controller PCB

1. Removing the DC Controller PCB

1) Disconnect the power plug.
2) Remove the four screws, and remove the rear cover.
3) Remove the two screws ①, and disconnect all connectors; then, remove the DC controller PCB ②.

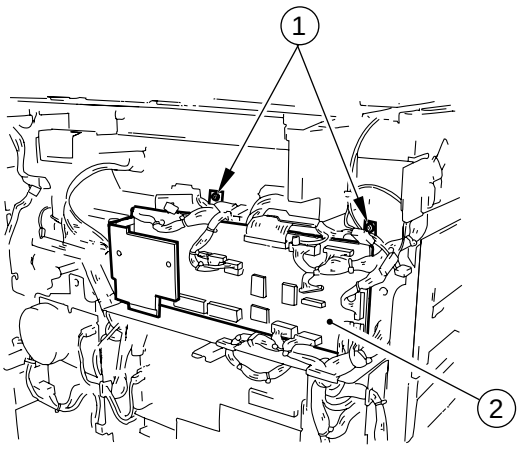

Figure 4-801

B. Composite Power Supply PCB

1. Removing the Composite Power Supply PCB

1) Remove the DC controller PCB.
2) Remove the two screws, and remove the connector mount ①.
3) Remove the two screws ③, and disconnect all connectors; then, remove the composite power supply PCB.

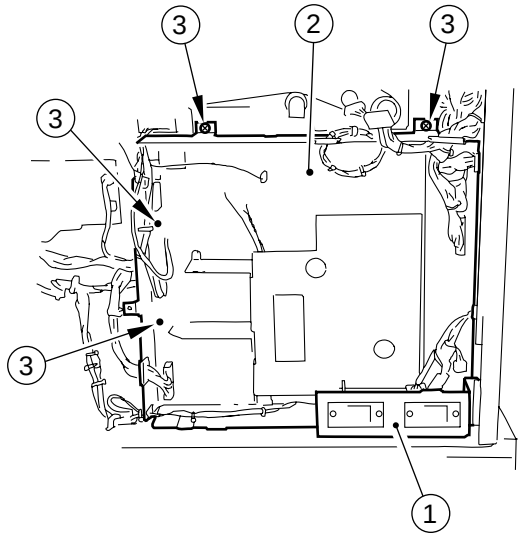

Figure 4-802

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2. Removing the LCD PCB and the CPU PCB

1) Disconnect the connector ①, and remove the six screws ②; then, remove the control panel support ③.

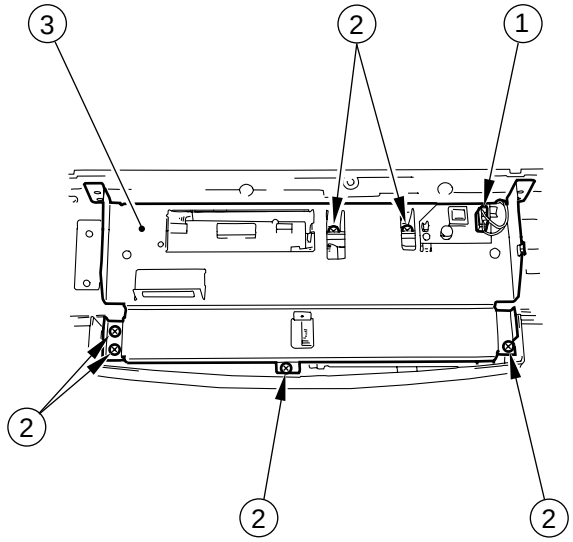

Figure 4-803

2) Remove the four screws and three flat cables; then, remove the LCD PCB ④.
3) Remove the two screws, and remove the switch PCB ⑤; then, remove the four screws and the two flat cables, and remove the CPU PCB ⑥.

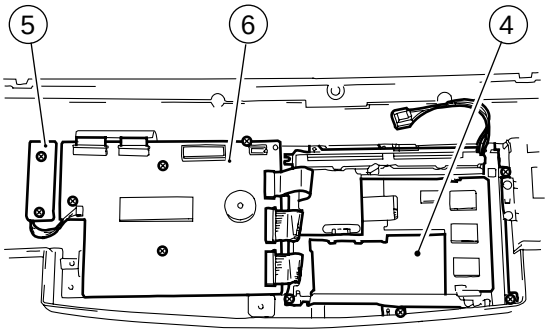

Figure 4-804

C. Replacing the ROM DIMM (image processor PCB)

1. Removing the ROM DIMM

1) Turn OFF The main power switch.
2) Disconnect the power cord from the power outlet.
3) Remove the copyboard glass, lens cover, and IP cover.
4) While opening the claw of the slot, lift the ROM DIMM to remove.

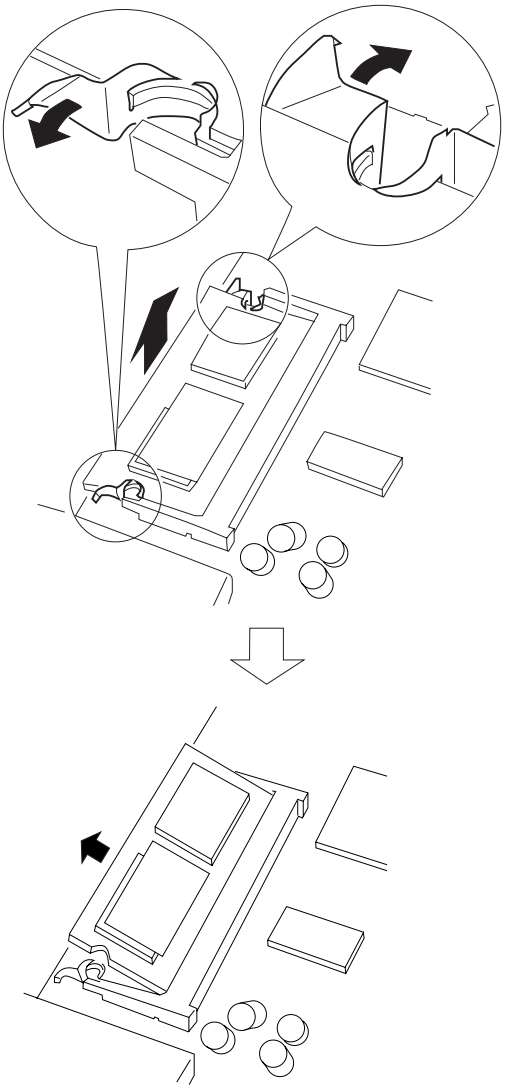

Figure 4-805

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2. Installing the ROM DIMM

1) Insert the ROM DIMM into the slot at an angle.

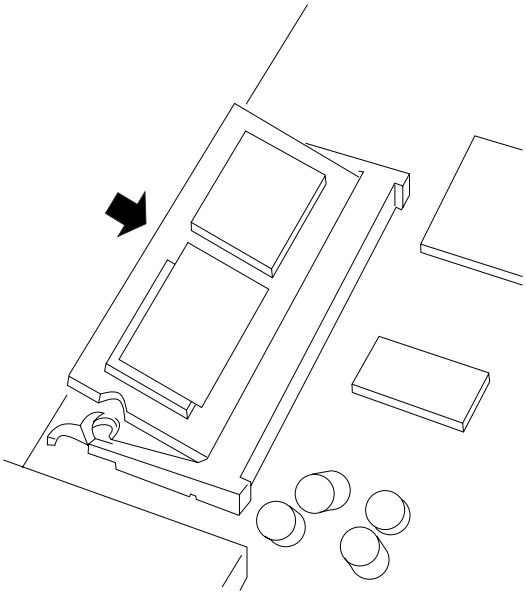

Figure 4-806

2) Shift down the ROM DIMM.

- Shift the ROM DIMM in the direction of the arrow until a click is heard.

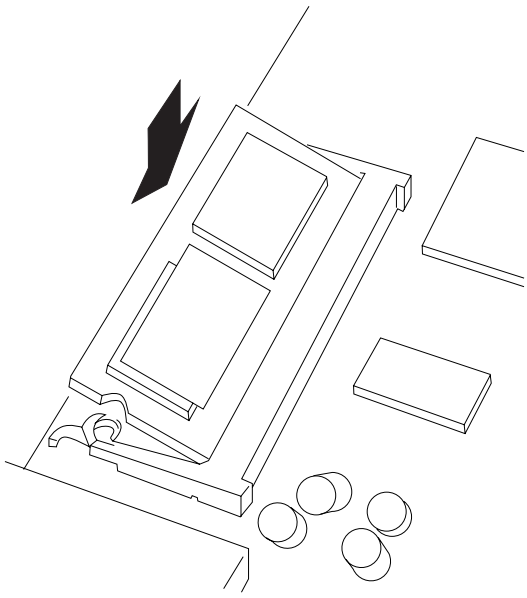

Figure 4-807

3) Install the covers that have been removed, connect the power cord to the power outlet, and turn ON the main switch.

CHAPTER 5

INSTALLATION

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I. SELECTING THE SITE

Make the following considerations when selecting the site; if possible, pay a visit to the user's before the delivery of the machine.

a. The site must provide a power outlet whose rating is as specified.
b. The site must be 7.5° to 32.5°C in temperature and 5% to 85% in humidity. Avoid areas near water faucets, water boilers, humidifiers, and refrigerators.
c. Avoid areas near sources of fire or areas subject to dust or ammonium gas. Avoid areas subject to direct rays of the sun; as necessary, provide curtains.
d. The site must be well ventilated.
e. The site must have a level floor so that all feet of the machine are in contact and the machine will remain level.
f. The site must allow at least 10 cm of space between the machine and any wall for maintenance work. (See the next page.)
g. The terminal of the telephone line is a modular type.
   • Otherwise, you need to convert it into a modular type.

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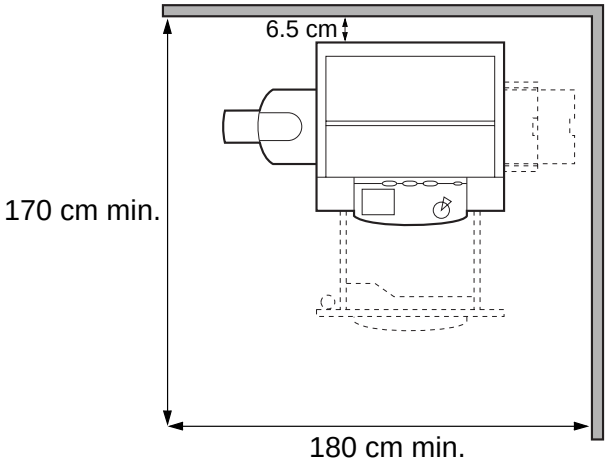
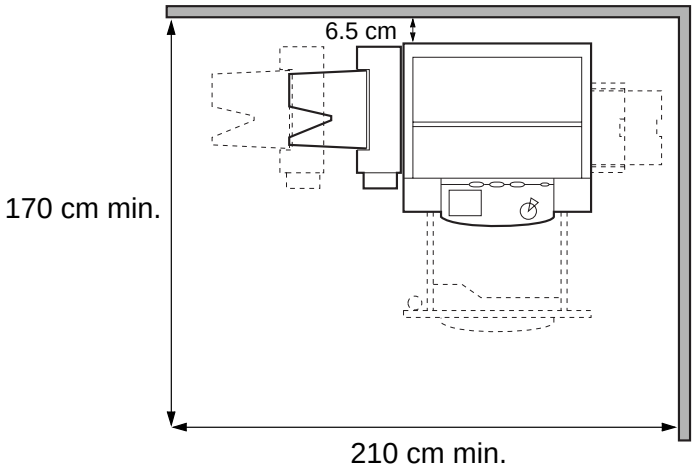
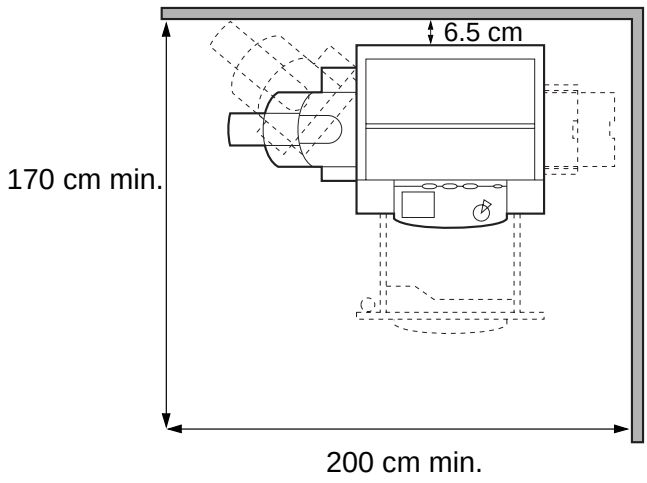
■ Space Needed for Servicing Work







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II. UNPACKING AND INSTALLATION

Bringing in a piece of metal from a cold to warm place can cause droplets of water to form on its surface. This phenomenon is called condensation, and a copier suffering from condensation can generate blank copies.

If the copier has been just moved from a cold place, leave it alone at least for one hour without unpacking it so that it will become used to the site temperature.

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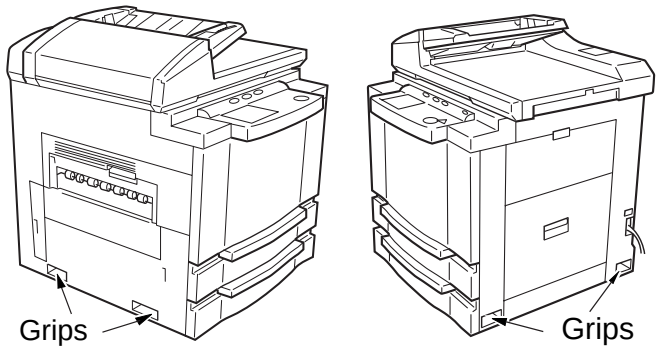
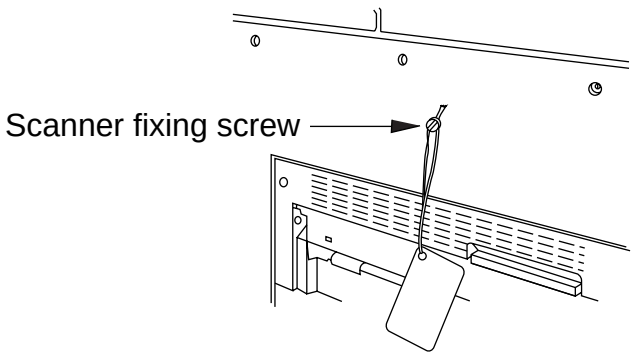
A. Unpacking

No.	Work	Remarks
1	Unpack the machine, and remove the plastic sheets. • If you are installing the pedestal, unpack it as well.	
2	Hold the grips of the machine, and lift and place the machine on the pedestal. (Work in a group of two.) (The figures on the right show a machine with an RDF.)	
3	Open the corrugated cardboard box that comes with the machine, and take out the parts and materials.	Check to make sure that none of the following is missing: • Copy tray • Operator's Manual (3 pcs. if the machine is with fax functions; 2 pcs. if otherwise) • Grounding cord • Drum unit • Toner • Lower right cover • Cassette size label (inside the cassette) • One-touch key label (if machine w/ fax function) • Modular cable (if machine w/ fax function) • Original delivery tray (if RDF/ADF standard machine) • Tray hinge (RDF only) • Tray hinge cover (RDF only)
4	Remove the scanner fixing screw from the outside of the lifter cover.	
5	Slide out the cassette, and remove the packing from inside.	

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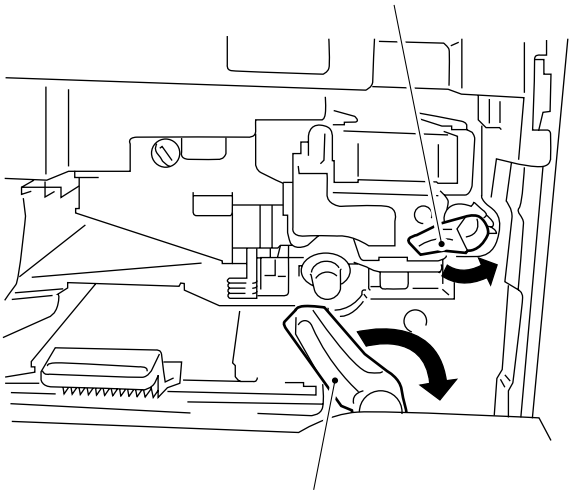
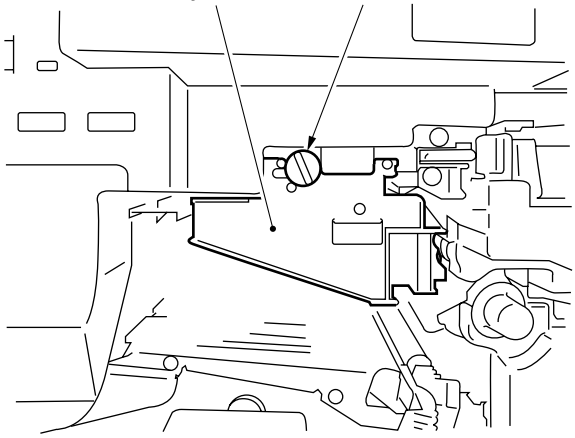
No.	Work	Remarks
6	Open the front door.	
7	Shift the feeding assembly releasing lever to release the feeding assembly.	Developing assembly locking lever  Feeding assembly releasing lever
8	Turn the developing assembly locking lever in the direction of the arrow shown in the figure.	
9	Remove the screws shown in the figure. • Keep the removed screws for installation of the drum unit.	Dummy drum Screw 
10	Pull the dummy drum straight out to the front to remove. • Dispose of the dummy drum.	

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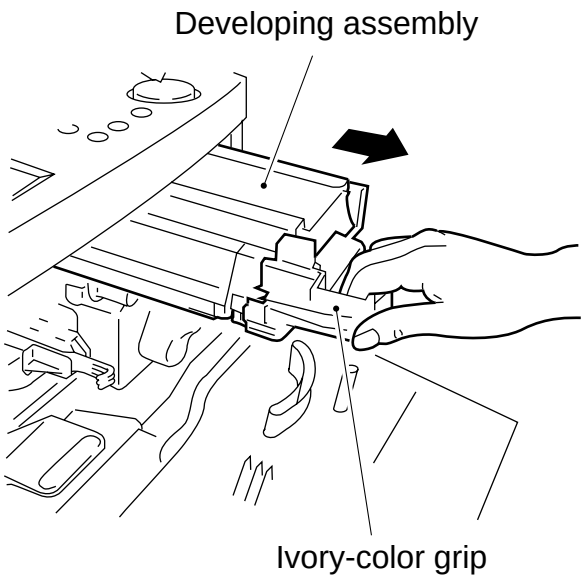
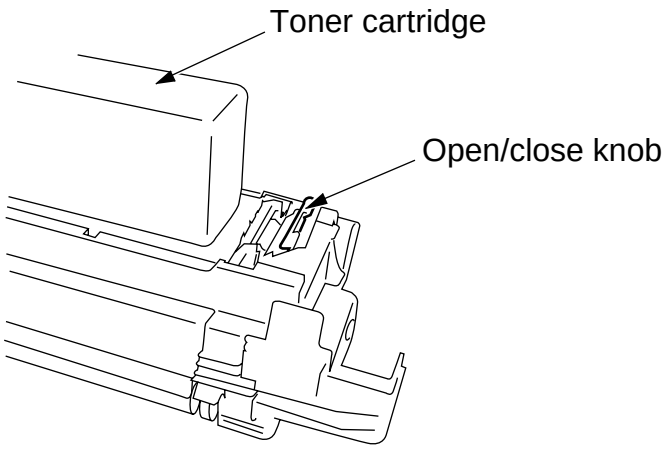
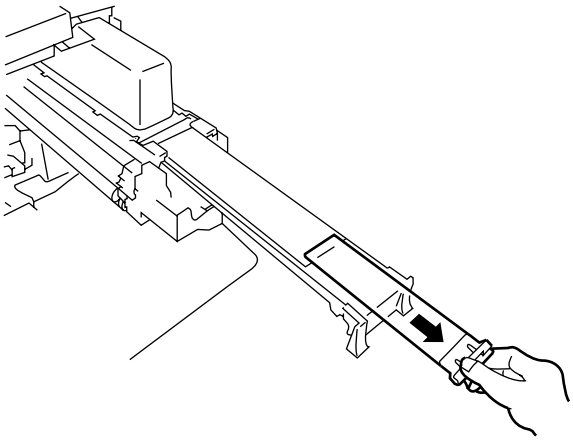
B. Supplying Toner

No.	Work	Remarks
1	Hold the ivory-color grip, and pull out the developing assembly to the front until it stops.	
2	Shake the toner cartridge several times.	
3	Set the toner cartridge in the developing assembly, and push it down until the opening knob comes off. • The toner cartridge will be locked to the developing assembly, and the opening knob of the toner cartridge will come off.	
4	While holding the toner cartridge, pull out the opening knob to the front until it stops.	

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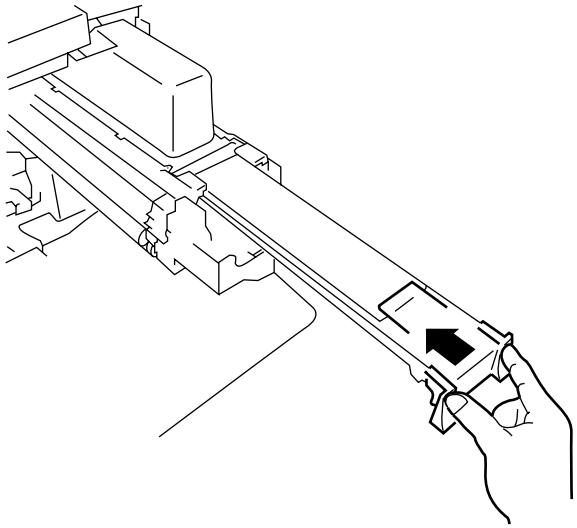
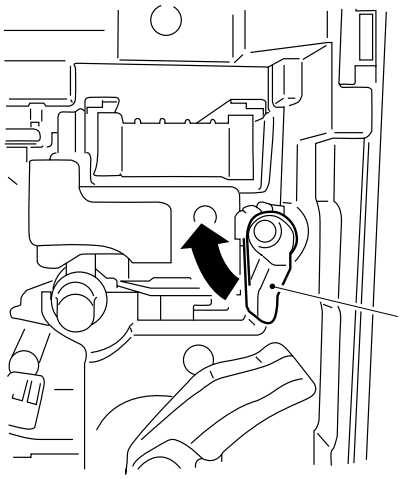
No.	Work	Remarks
5	Tap lightly on the top of the toner cartridge so that all toner will fall off.	
6	Push the black cover of the developing assembly back into its original position. • The toner cartridge will come off.	
7	Remove the toner cartridge.	
8	Push in the developing assembly until it stops.	
9	Turn the developing assembly locking lever in the direction of the arrow to lock the developing assembly in place.	

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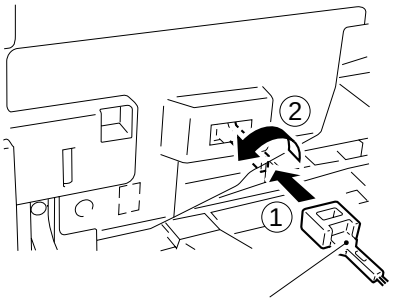
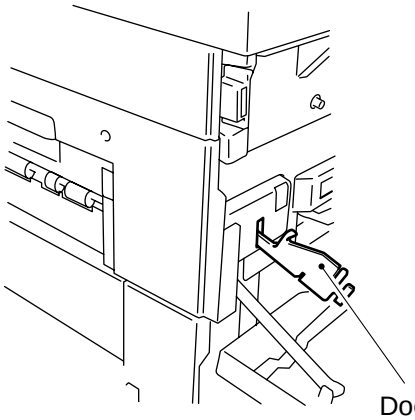
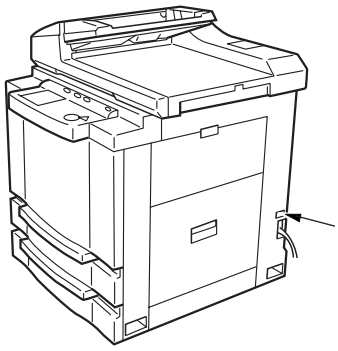
C. Stirring the Toner

No.	Work	Remarks
1	Insert the handle of the static eliminator cleaning brush into the fixing assembly releasing lever assembly, and lock the fixing assembly.	 Separation static eliminator cleaning brush
2	Insert the door switch actuator into the door switch assembly, and turn ON the door switch.	 Door switch actuator
3	Connect the power plug to the power outlet.	The power outlet must be rated as specified.
4	Turn on the main power switch.	 Main power switch

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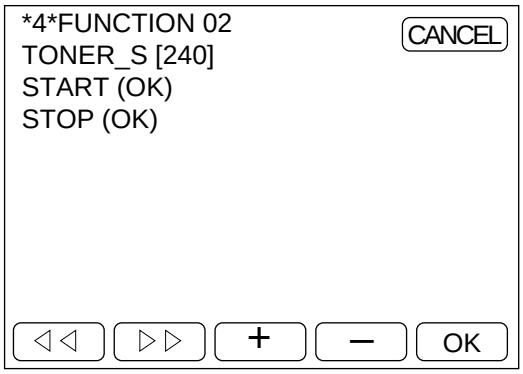
No.	Work	Remarks
5	Execute service mode as follows: 1) Press the service switch. 2) Check to make sure that '$' is indicated in the upper left of the control panel LCD; then, press the * key twice. 3) Press 'FUCNTION' (*4*) toe select; then, press the OK key. 4) Press the [▷▷] key to turn pages to the Toner Stirring screen. 5) Press 'START' on the screen; then, press the OK key. • Toner stirring starts. • Install the copy tray while the toner is being stirred.	Toner Stir screen  The toner stirring operation takes 240 sec (4 min), and the operation will stop automatically.

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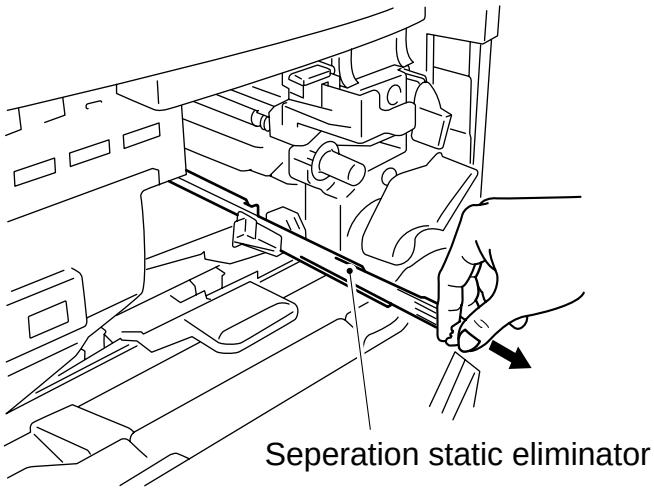
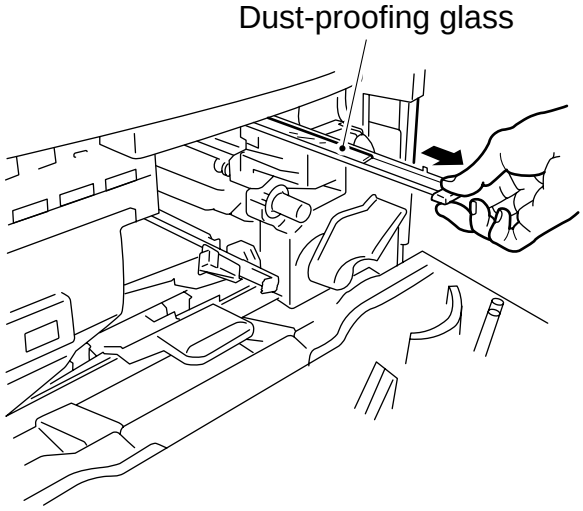
D. Installing the Drum Cartridge

No.	Work	Remarks
1	Turn OFF the main power switch.	
2	Release the developing assembly lever.	
3	Remove the static eliminator, and clean with the special cleaning brush. After cleaning, put back the separation static eliminator. (Push it until a click is felt.)	
4	Remove the dust-proofing glass, and clean it with lint-free paper; thereafter, put the dust-proofing glass back into its original position.	

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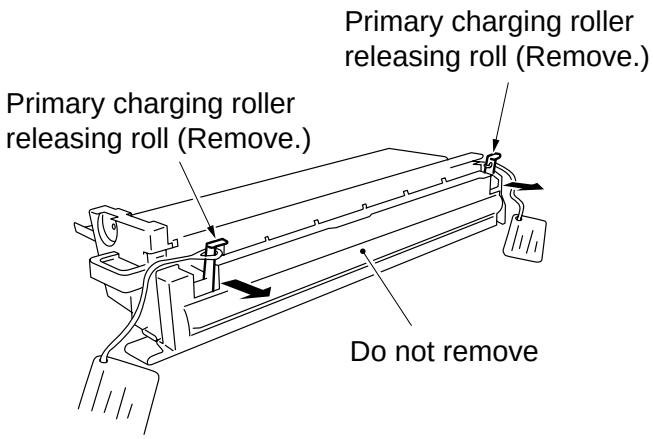
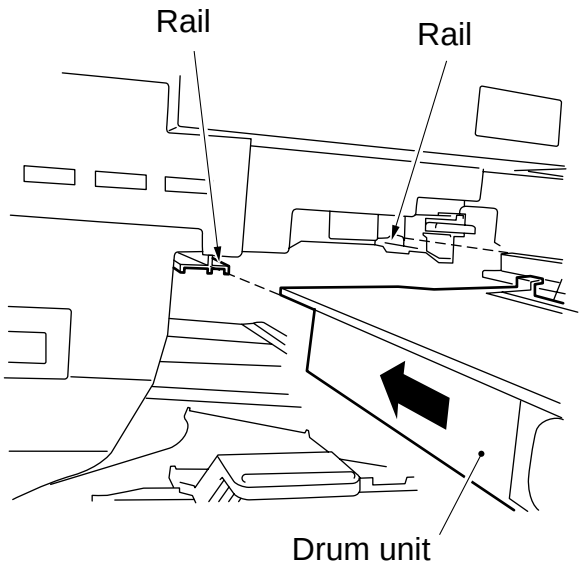
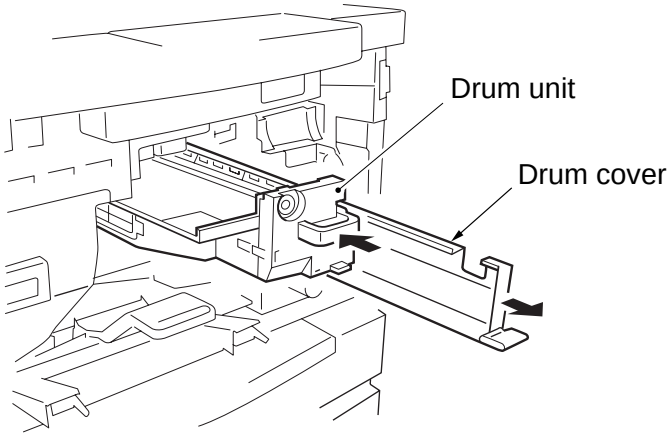
■120V model (230V model; see p.5-12)

No.	Work	Remarks
5	Unpack the drum unit, and remove the two primary charging roller releasing rolls without removing the drum cover. • Do not remove the drum cover (to prevent damage). • Hold the drum at its middle when taking it out of the box (to prevent damage).	
6	Check to make sure that the developing assembly is released; then, without removing the drum cover, insert the drum unit slowly along the rail.	 

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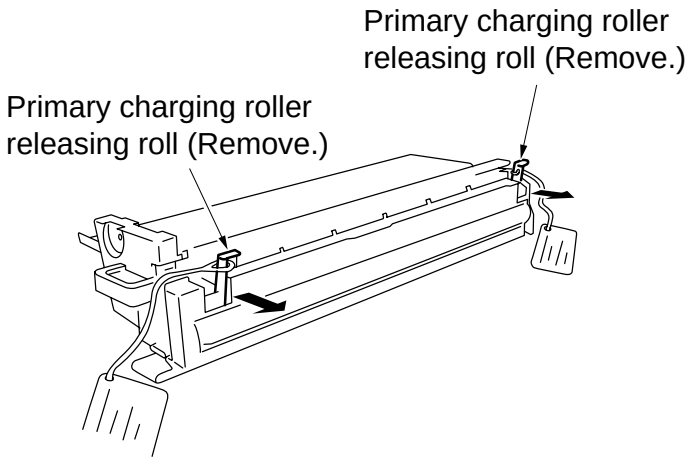
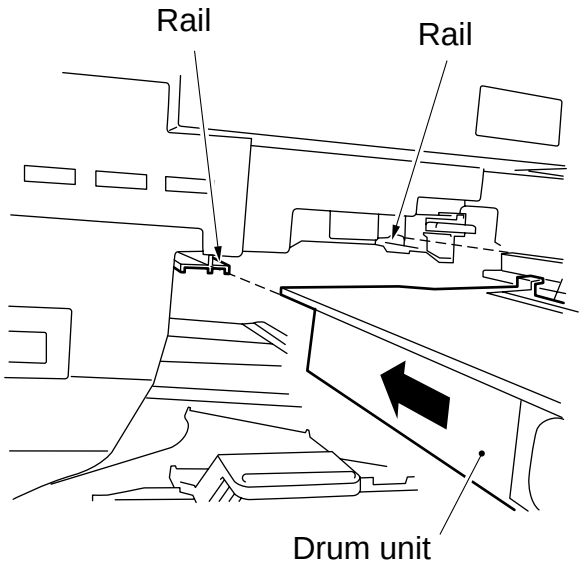
■230V model

No.	Work	Remarks
5	Unpack the drum unit, and remove the two primary charging roller releasing rolls. • Hold the drum at its middle when taking it out of the box (to prevent damage).	
6	Check to make sure that the developing assembly is released; insert the drum unit slowly along the rail.	

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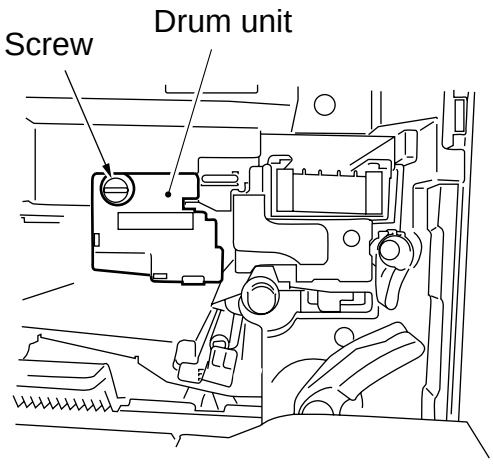
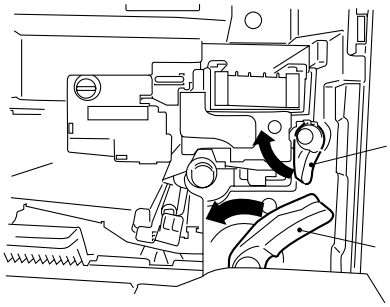
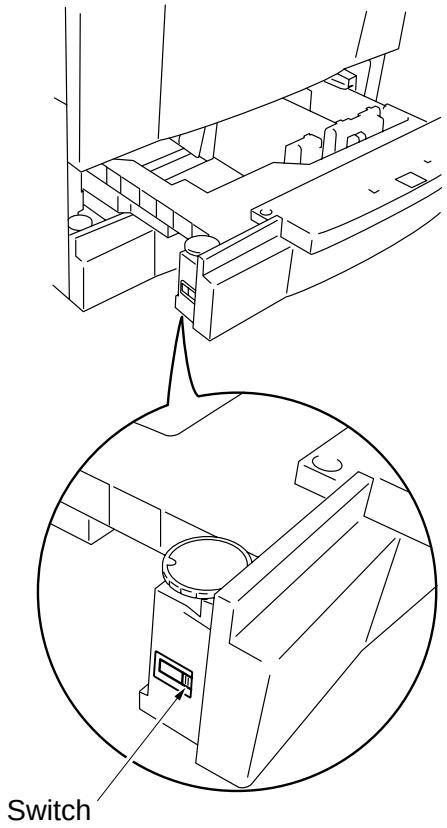
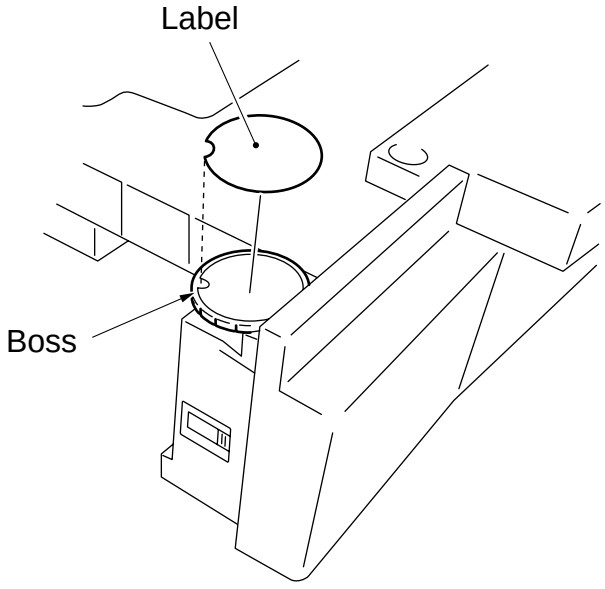
No.	Work	Remarks
7	Fix the drum unit in place with the screw removed previously.	
8	Fill out the label, and attach the label to the front cover of the drum unit.	date date Datum counter compteur Zähler notes note Notiz
9	• Lock the developing assembly in place by operating the developing assembly releasing lever. • Lock the feeding assembly in place.	

E. Installing the Cassettes

No.	Work	Remarks
1	Slide out the cassette.	
2	Check with the user to find out the most frequently used type of copy paper. Then, operate the switch to select A/B- or Inch-configuration. Each cassette has its own switch. Be sure to set all switches. If you changed the switch position, you must change the paper size dial label in the next step.	
3	Attach the label to the paper size dial. (At this time, be sure to match the boss on the dial and the cut in the label.) **Note:** The label may be for A/B- or Inch-configuration. Be sure the correct label is used.	

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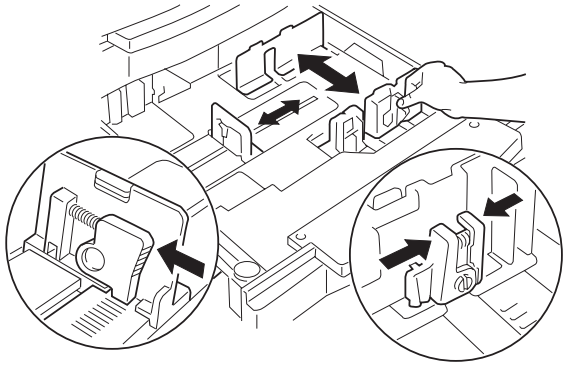
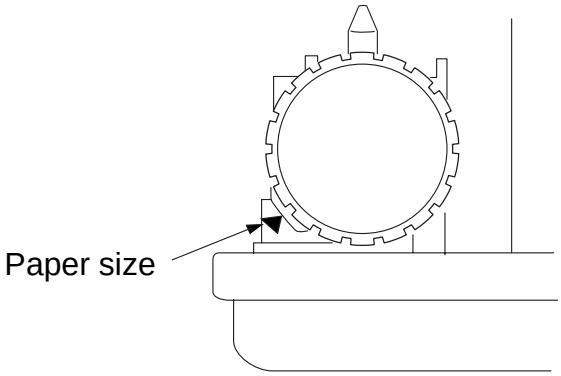
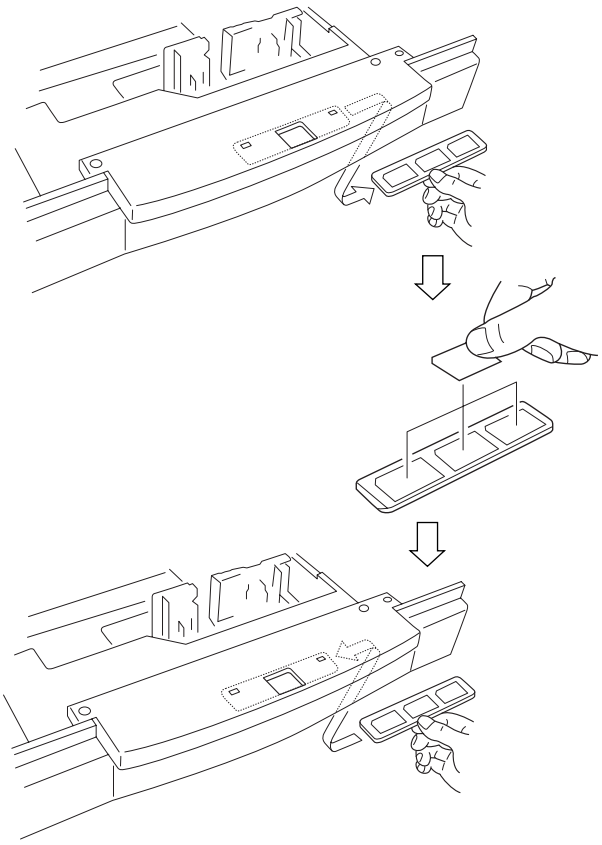
No.	Work	Remarks
4	Holding the lever of the width guide and the length guide, slide the guides to suit the index of the appropriate paper size.	
5	Set the paper size dial to the appropriate paper size.	
6	Attach the cassette size label as shown to indicate the selected paper size. • Keep in mind that the middle cassette will not hold paper A3 or 11×17 in size.	
7	Put coy paper.	

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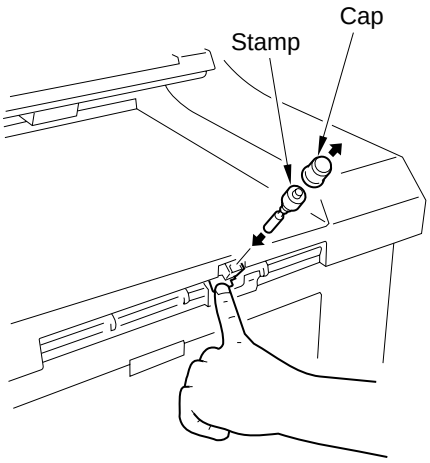
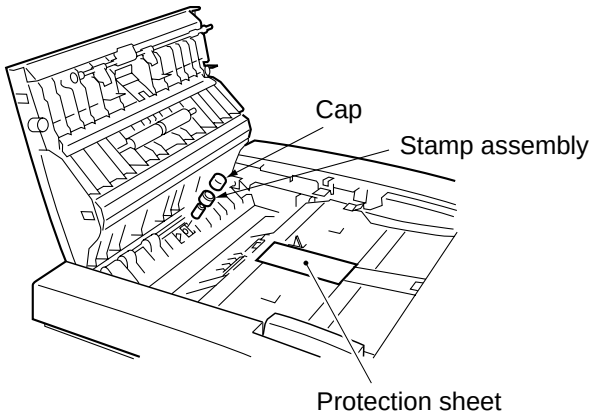
F. Installing the Feeder

No.	Work	Remarks
1	Install the stamp.	
	■ RDF-G1 Open the RDF delivery cover. Remove the stamp cap, and install the stamp. Do not touch the face of the stamp. If your hands become stained with ink, wash them immediately.	
	■ ADF-F1 Open the ADF cover, and remove the protection sheet from the separation assembly and the stamp cap. Do not touch the face of the stamp. If your hands become stained with ink, wash them immediately.	

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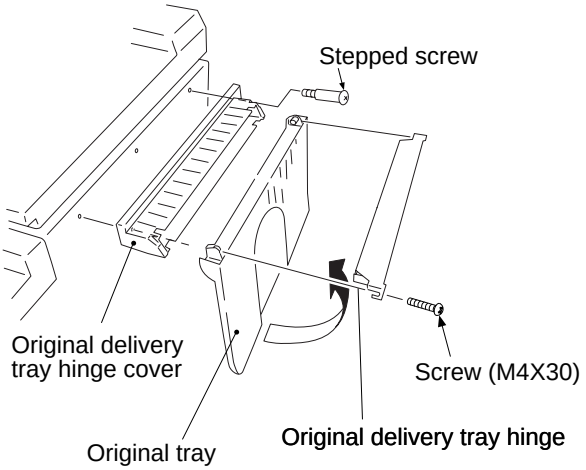
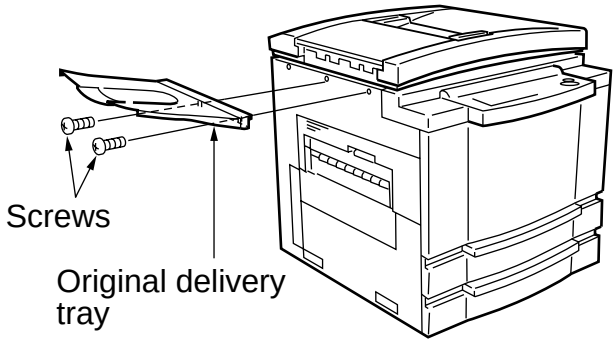
No.	Work	Remarks
2	Install the original delivery tray.	
	■ RDF-G1 Use two screws.	
	■ ADF-F1 Use two screws.	
3	Connect the signal cable of the RDF or the ADF to the copier.	

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G. Machine Specifications Setting Mode (*5*)

No.	Work	Remarks
1	Turn ON the main power switch.	
2	Press the user mode key, and set the following items: • Date • Time	
3	Press the service switch, and press the * key twice.	• '$' will be indicated in the upper left of the LCD, and the Service Mode Menu screen will be displayed.
4	Press 'OPTION' (*5*) to highlight; then, press the OK key.	
5	Select the item to set.	Ex. COPY-LIM: upper limit of copy count. SHUT-OFF: ON/OFF of switch to sleep mode. CST-U1: ON/OFF of notation of U-size cassette paper size.
6	If the machine is equipped with fax functions, go to H. "Fax Settings." Otherwise, go to I. "Checking Copy Images."	

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H. Fax Settings (for machines equipped with fax functions)

1. Executing All-Clear

No.	Work	Remarks
1	Press ‘Cancel’ so that the Service Mode Menu screen will appear.	
2	Press ‘FAX’ (*8*) to highlight; then, press the OK key.	
3	Press ‘#8 CLEAR’ to highlight; then, press the OK key.	
4	Press ‘ALL’ on the screen to highlight; then, press the OK key.	
5	Turn OFF the main power switch.	

2. Connecting to the Telephone Line (for machines equipped with fax functions)

No.	Work	Remarks
1	Connect the modular cord to the line modular jack found at the rear of the machine.	• The topmost modular jack is for a telephone line.
2	Connect the other end of the modular cord to the modular jack of the telephone line.	

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3. Setting the Dialing Type (for model with FAX function only)

No.	Work	Remarks
1	Turn ON the main power switch.	
2	Press the User Mode key, and press 'FAX spec settings' on the screen that has appeared.	
3	Press 'Basic Registration'. • The Basic Registration Setting screen appears.	
4	Press the ▼ key to open the 2/3 screen; then, press 'Selecting Line Type'.	
5	Select the appropriate telephone line type, and press the OK key.	• 20 pps • 10 pps • Touch tone
6	Press the 'Close' key several times to return to the Standard screen.	

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4. Adjusting the Transmission Level (for model FAX function only)

No.	Work	Remarks
1	Start FAX service mode.	Starting FAX Service Mode 1) Check to make sure that the handle of the separation static eliminator cleaning brush is inserted into the fixing assembly releasing assembly. In addition, make sure that the door switch actuator is inserted into the door switch assembly. 2) Push the service switch with a hex key. 3) Press the * key twice. • The Service Mode Menu screen will appear. 4) Press '*8* FAX' on the screen, and press the OK key. • The Menu screen will appear.
2	Press '#2. MENU' on the Menu screen, and press the OK key.	
3	Press 'ATT (P)' on the screen to open the Value Input screen. Press the appropriate item to highlight, and enter the appropriate value using the key-pad; then, press the OK key.	
4	• To continue on to adjust NL, go to step 3 of NL adjustment. • To not continue on to adjust NL, press the Cancel key, and press the Reset key twice to end service mode.	

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5. Adjusting NL (for model with FAX function only)

No.	Work	Remarks
1	Start FAX service mode.	Starting FAX Service Mode 1) Check to make sure that the handle of the separation static eliminator cleaning brush is inserted into the fixing assembly releasing assembly. In addition, make sure that the door switch actuator is inserted into the door switch assembly. 2) Push the service switch with a hex key. 3) Press the * key twice. • The Service Mode Menu screen will appear. 4) Press '*8* FAX' on the screen, and press the OK key. • The Menu screen will appear.
2	Press '#2. MENU' on the Menu screen, and press the OK key.	
3	Press 'NLEQ' on the screen to highlight. When the ON/OFF Setting screen has appeared, press 'ON' or 'OFF'. (The selected notation will be highlighted.)	
4	Press the OK key.	
5	Press the Cancel key, and press the Reset key twice to end service mode.	

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6. Communications Test (for machines equipped with fax functions)

No.	Work	Remarks
1	Remove the static eliminator cleaning brush and the door switch actuator; then, close the front door.	
2	Perform “test shots” to make sure that the images are normal.	Taking Test Shots 1) Press the FAX key to select the FAX Standard screen. 2) Press the Extension Mode key. 3) Press the Test Shot key, place an original, and press the OK key.
3	Try communications tests to check the operation and the images.	

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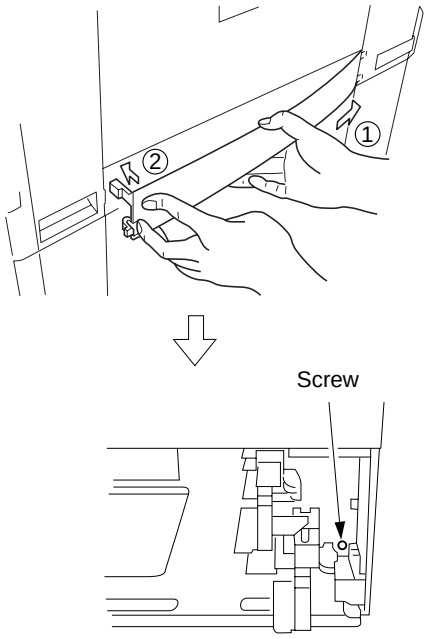
I. Checking the Copy Images

No.	Work	Remarks
1	If in service mode, press the Reset key twice to end it.	If the front door is open, remove the door switch actuator and the separation static eliminator brush; then, close the front door.
2	If the copier is not on a pedestal, install the lower right cover as shown; then, slide out the upper and lower cassettes, and fit and tighten a screw.	
3	Using the NA-3 the Chart, make copies to check the images.	■ Optimum Images Text: The white background is free of fogging. Text/Photo: Step edge No. 10 is barely visible; the white background if free of fogging. Photo: The white background is free of fogging. (Moire near the step edge of halftone bands may be ignored.
4	Clean the area around the machine, and fill out the service sheet.	

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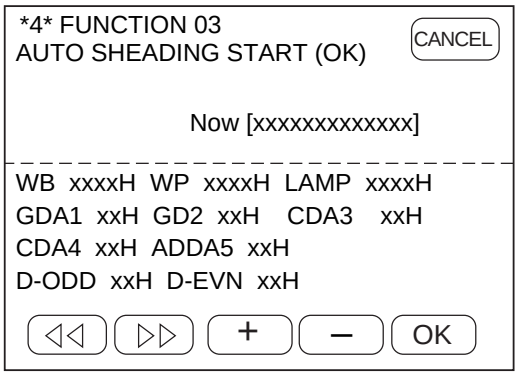
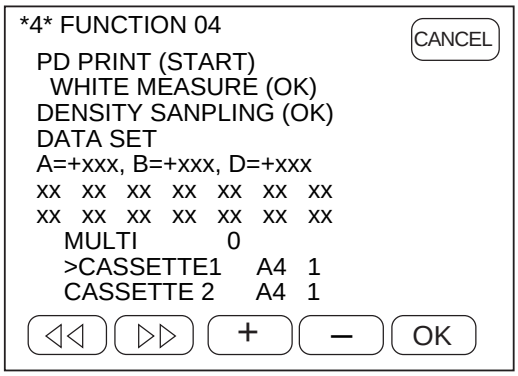
Caution:
Perform the following adjustments (“Shading Adjustment” and “Automatic Density Adjustment”) only if the copy images are not optimum.

1. Shading Adjustment

No.	Work	Remarks
1	Start service mode, and execute shading.	Start service mode. • Open the front door. • Insert the handle of the static eliminator cleaning brush into the fixing assembly releasing assembly. • Turn ON the door switch with the door switch actuator.
	Press the service switch with a hex key.	
	Press the * key twice.	
	Press ‘FUNCTION’ (*4*) on the LCD to highlight; then, press the OK key.	
	Press the [▷▷] key to turn pages to the Shading screen.	
	Press ‘AUTO SHADING START’ on the LCD to highlight.	
	Press the OK key. • Shading will be executed. • Shading will end when ‘Now [END]’ appears.	

2. Automatic Density Adjustment

No.	Work	Remarks
1	Execute automatic density adjustment. • Execute 'PD', '200PWM', and '600PWM'.	
	Press the Reset key once to end service mode. • '$' will be indicated in the upper left corner of the screen.	
	Holding the feeder or the copyboard cover at about 45°, make two A4 copies (solid black).	
	Press the* key twice.	
	Press 'FUNCTION' (*4*) on the screen to highlight; then, press the OK key.	
	Press the ▷▷ key to turn pages to the PD Density Automatic Adjustment screen.	
	Close the front cover halfway, and press 'PD PRINT' on the screen to highlight; then, press the Copy Start key. • The copier will generate a test pattern. (You will use the Test Pattern later.)	

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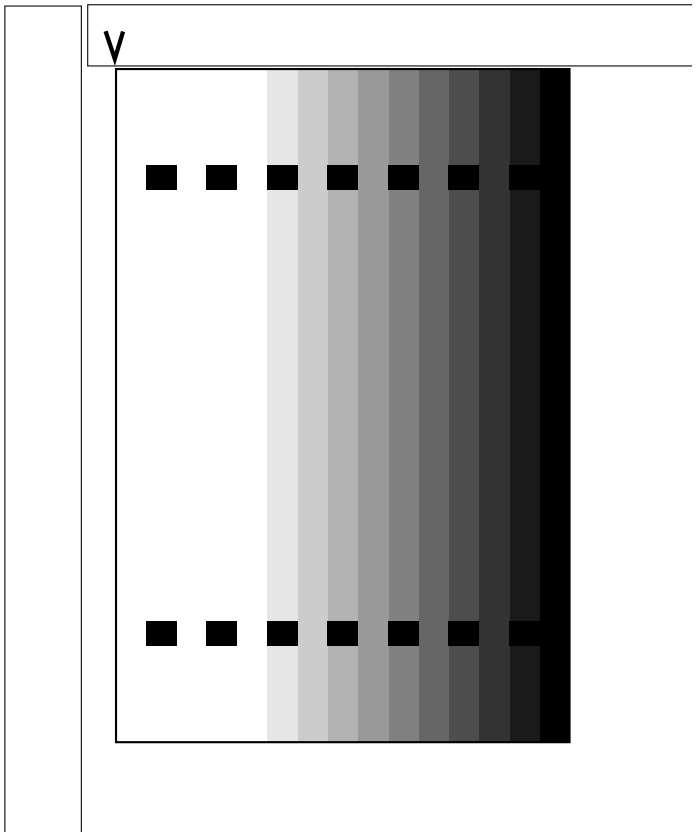
<table>
<tr><th>No.</th><th>Work</th><th>Remarks</th></tr>
<tr><td>1</td><td>Automatic Density Adjustment

Place a blank white sheet of copy paper (A4/LTR or larger; not for color copiers; but the whitest of all used by the user) on the copyboard glass. Then, close the feeder or the copyboard cover.</td><td></td></tr>
<tr><td></td><td>Press ‘WHITE MEASURE’ on the screen to highlight; then, press the OK key.</td><td>The scanner makes a single scan.</td></tr>
<tr><td></td><td>Place the Test Pattern as shown on the copyboard glass, and close the feeder the copyboard cover.
Then, press ‘DENSITY MEASURE’ to highlight, and press the OK key.
• The scanner makes 13 scans.</td><td>Place the Test Pattern against the V marking in the rear left of the copyboard glass. (If the sheet is not placed correctly, adjustment may not be accurate.)

Place the pattern print as follows:

Face down, i.e., the printed side at the bottom.</td></tr>
<tr><td></td><td>After executing ‘DENSITY MEASURE’, check to make sure that the settings under ‘A’, ‘B’, and ‘D’ are as specified:
Insert
PD 200PWM { 20 ≤ A ≤ 50, –40 ≤ B ≤ 40, 0 ≤ D ≤ 8
600PWM { 20 ≤ A ≤ 60, –70 ≤ B ≤ 20, 0 ≤ D ≤ 8

If the settings are as specified, press ‘SET’ to highlight; then, press the OK key.
• The above ends PD automatic density adjustment; execute 200PWM density automatic adjustment.</td><td></td></tr>
</table>

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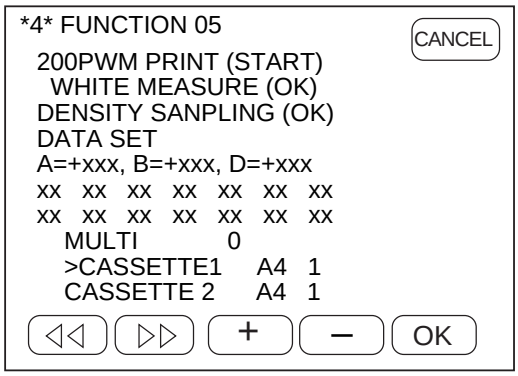
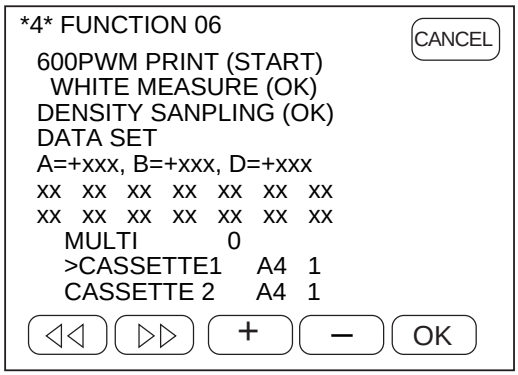
No.	Work	Remarks
2	Press the [▷▷] key to turn pages to the 200PWM Density Automatic Adjustment screen.	
3	Perform 200PWM density automatic adjustment. • Work as shown for PD density adjustment.	
4	Press the [▷▷] key to turn pages to the 600PWM Density Automatic Adjustment screen.	
5	Perform 600PWM density automatic adjustment. • Work as shown for PD density adjustment.	
6	Press the Reset key twice.	
7	Place the Test Chart (NA-3) on the copyboard glass, and close the front cover halfway. Then, make copies at copy density 5 in text mode, test/photo mode, and photo mode. • Try all the cassettes and the multifeeder.	■ Optimum Images • For text mode, the white background must be free of fogging. • In text/photo mode, step edge No. 10 must be barely visible and the white background must be free of fogging. • In photo mode, the white background must be free of fogging. (Moire around step edges around halftone bands may be ignored.)

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After completing all the above installation work, install options (sorter, etc.).

■ Handling the Photosensitive Drum after Installation

The photosensitive drum is highly susceptible to light, and mere exposure to room lighting can lead to generation of copies with white spots or black bands. Keep the following in mind to prevent problems:

- Try to finish jam removal work within 5 min.
- When taking the drum unit out of the copier for servicing, wrap it in fresh copy paper, and keep it in a dark place.
- Do not touch the surface of the photosensitive drum.
- If the surface of the photosensitive drum is soiled, wipe it with a flannel cloth coated with toner. (Do not use paper, lint-free or otherwise.)
- Do not dry wipe or do not use solvent.

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III. RELOCATING THE MACHINE

Perform the following work when the machine must be relocated after installation by truck or other means of transportation:

1. Points to Note

If you have to move the copier placed on its pedestal from room to room, do not lift the copier with your hands in the grips; such will separate the copier from its pedestal. Be sure to hold the pedestal when lifting the machines.

2. Before Relocating the Machine

Step	Work	Checks	Remarks
1	Remove the drum unit.	Put the drum unit in a separate box for transport.	
2	Fix the scanner in place.		
3	Tape the charging assemblies and the feeding assembly releasing lever in place to prevent displacement by vibration.		
4	Tape the front door and the delivery assembly in place.		
5	Place a single sheet of A3 copy paper on the copyboard glass, and tape the copyboard cover (feeder) in place.		

3. Lifting the Copier Off the Pedestal

Step	Work	Checks	Remarks
1	Open the pedestal's right corner, and release the guide (shift to the right) used to join the pedestal and the copier.		
2	Hold the copier's grips, and lift the copier upright so that the pedestal's pin will slide off the holes. (Work in a group of two.)		
3	Lower the copier on the floor or on a desk.		

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IV. INSTALLING THE CONTROL CARD V

Caution:
Check to make sure that the MEMORY TX/RX indicator is OFF before turning OFF the main power switch.

1. Removing the Control Panel

1) Remove the following so that the inside cover may be removed:
   - Front door
   - Fixing cover
   - Drum unit (Release the developing assembly.)
   - Feeding assembly lever
   - Registration roller knob
   - Upper cassette
2) Remove the five screws, and remove the inside cover.
3) Remove the following so that the control panel may be removed:
   - Fixing controller PCB (1 screw)
   - Magnet plate from control panel top (1 screw)
   - RS232C connector (1 screw)
4) Remove the four screws, and disconnect the four connectors; then, remove the control panel, and turn it over.

2. Before Installation the Control Card

1) Remove the control card slot face plate ①.

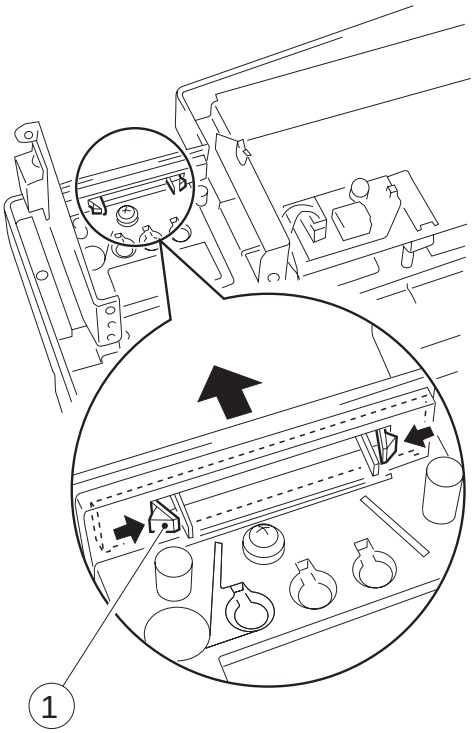

Figure 5-401

2) Remove the screw from the face plate ②.

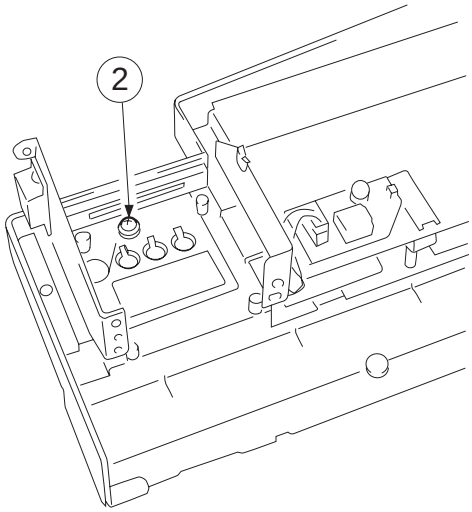

Figure 5-402

3) Remove the protection sheet from the display of the Control Card V.

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3. Installing the Control Card

1) Fix the Control Card ① in place on the control panel using four screws ②.

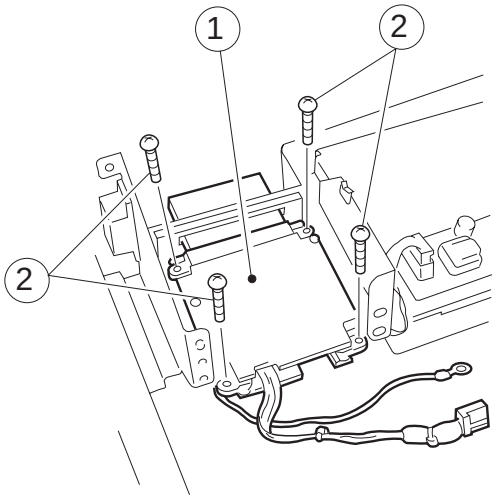

Figure 5-403

Note 1:
Try sliding in and out a card, and fix the Control Card V in place where card may be moved smoothly.

Note 2:
Check to make sure that the connector ③ for the printer is centered over the hole.

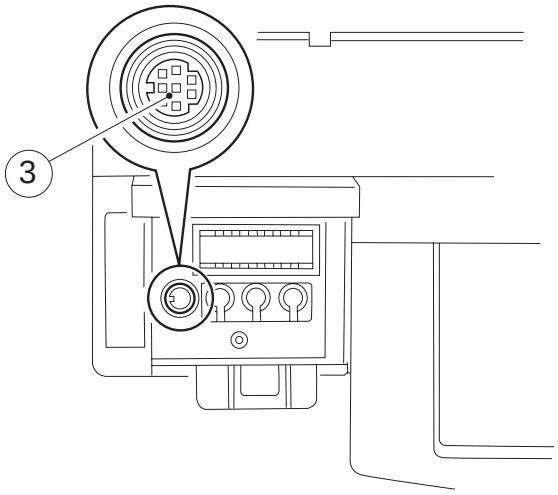

Figure 5-404

2) Install the grounding wire ④ of the Control Card V while paying attention to avoid trapping the wires.
3) Install the control panel to the copier.
4) Install the fixing controller PCB ⑤.
   At this time, be sure to fix the grounding wire ⑥ of the Control Card V in place by tightening the screw.

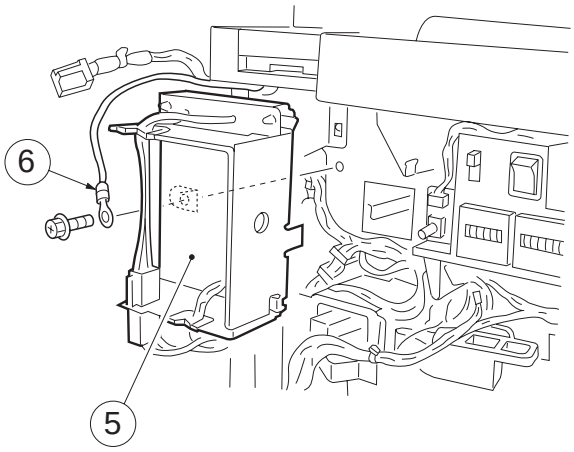

Figure 5-405

5) Cut the harness band ⑦ shown, and disconnect the shorting connector ⑧.

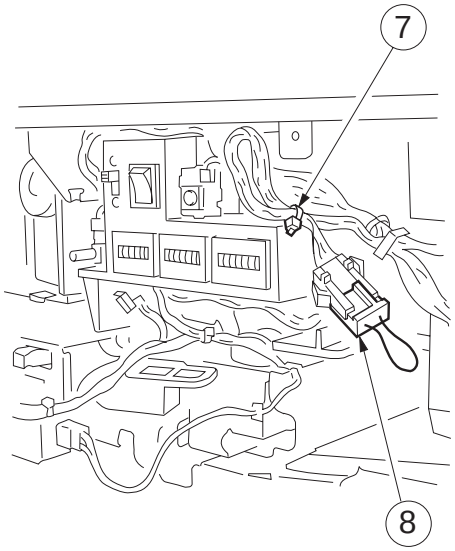

Figure 5-406

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6) Lead the 4P connector ⑨ of the copier through the edge saddle of the control panel side plate.
7) Connect the 4P connector ⑪ of the Control Card V and the copier's 4P connector.

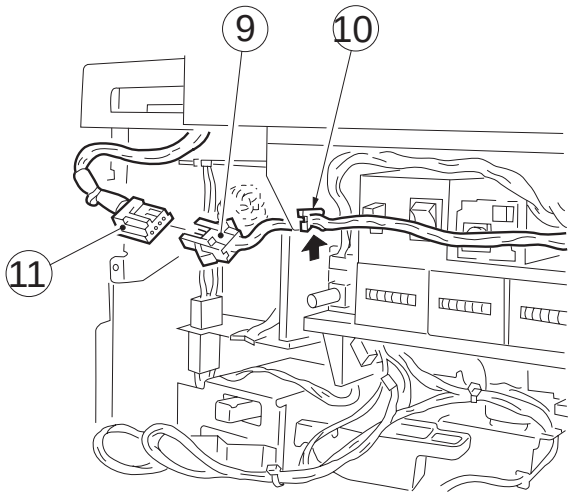

Figure 5-407

8) Place the plastic sheet ⑫ in the hole in the control panel (used for the display of the Control Card V).

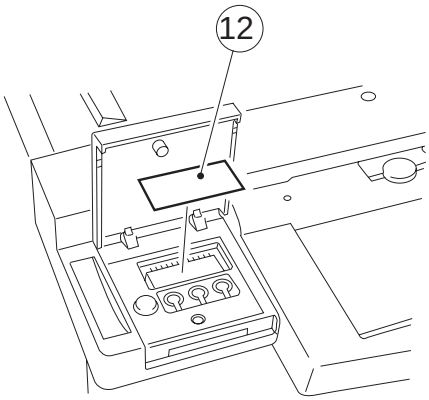

Figure 5-408

9) Remove the protection sheet from the control panel guide plate of the Control Card V.
10) Attach the control panel guide plate ⑬ on the copier's control panel.

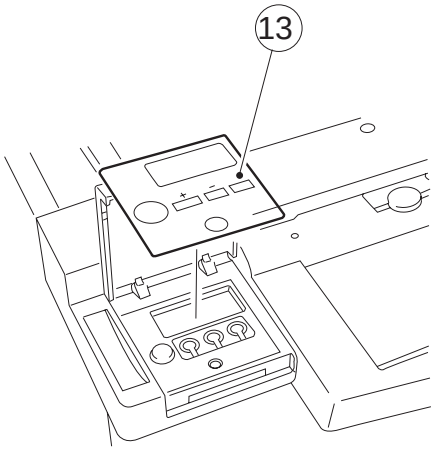

Figure 5-409

11) Attach the memory record sheet and the transparent sheet.
12) Turn OFF the copier' power switch, and check the operation of the Control Card V.

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V. COPY DATA CONTROLLER-A1

1) Remove the two screws 2, and remove the upper cover 1.

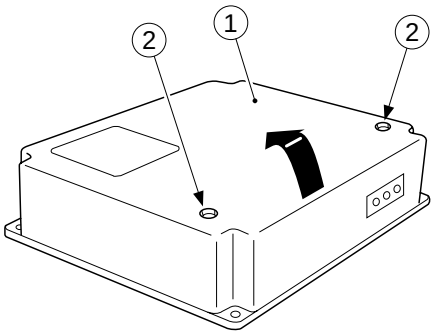

Figure 5-501

2) Set the DIP switch (SW1, SW5) on the Copy Data Controller-A1 to suit the needs of the user.

2-1) Set the DIP switch (SW1-4) to suit the copier type.

2-2) To use the group control function, set bit 2 of the DIP switch (SW5) to suit the control paper size.

To use AB-configured papers (A3, A4, B4, B5), set the bit to OFF.

To use Inch-configured papers (11x17, LTR, LGL, STMT), set the bit to ON

	Bit	Position	Function	Remarks
SW1	1~3	OFF	For normal operation.	
	4	ON	For IPC communication.	CLC700/800, NP6750, NP6016, GP Series
		OFF	For serial communication.	NP6030, NP6060, NP8530, NP9800
	5	ON	For using a central control device.	Requires the Interface Board-B1.
		OFF	For normal operation or for remote control using a commercially available modem.	Requires a commercially available modem and the Interface Board-B1 for remote control via a modem.
	6	ON	For initializing the RAM.	
		OFF	For normal operation.	
SW5	1	ON	For factory adjustment.	
		OFF	For normal operation.	
	2	ON	For control of Inch-configured papers (11x17, LTR, LGL, STMT).	To select a paper other than indicated, use service mode. See 10) of 5. "Checking the Operation."
		OFF	For control of AB-configured papers (A3,A4, B4, B5).	
	3	ON	For service mode.	
		OFF	For normal operation.	
	4	ON	For group control.	*1 See Note.
		OFF	For not using group control.	
	5, 6	OFF	Not used.	

Note

If the Control Card V is to be used or if remote control only by the Copy Data Controller-A1 is to be used*, set bit 4 of the DIP switch (SW5) to OFF.

Table 5-501

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2-3) If not to use group control, shift bit 4 of the DIP switch (SW5) to OFF.
To connect the Interface Board-B1, Communication Control Board-A1, or the Interface Board-A1, see "Setting the Board" in the appropriate Installation Procedure.

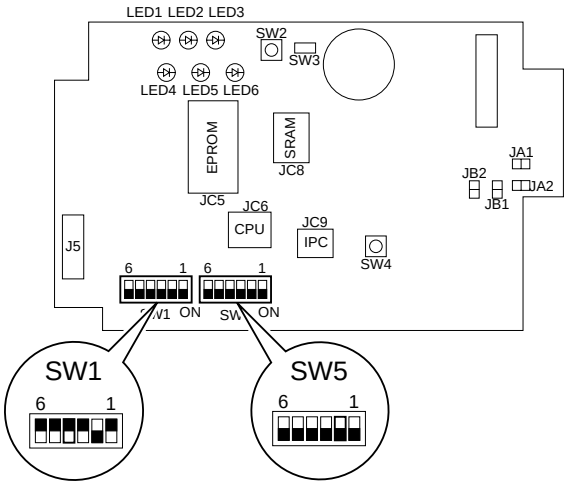

Figure 5-502

3) Arrange the jumper connectors (JA1, A2, JB1, JB2) on the Copy Data Controller-A1 to suit the needs of the user.

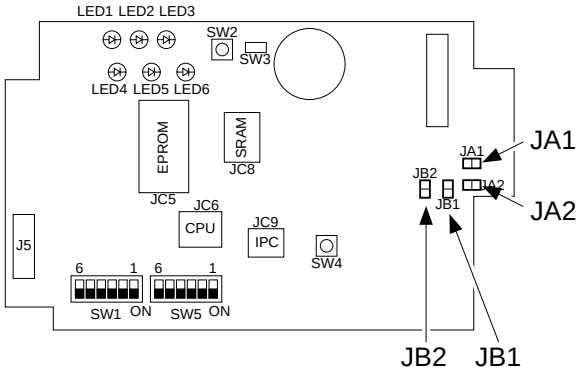

Figure 5-503

A: To connect the Communication Control Board-A1 or the Interface Board-B1 (requires Power Supply-A1):

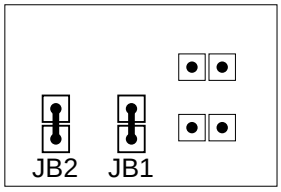

Figure 5-504

B: To not connect the Communication Control Board-A1 or the Interface Board-B1 (does not require Power Supply-A1):

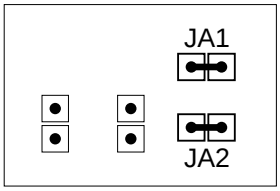

Figure 5-505

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2. Installing to the Copier

Keep the following in mind when installing the Copy Data Controller-A1 to the copier:

1. Follow the appropriate laws and regulations of the country of installation.
2. Be sure that the copier has been installed properly before starting the work.
3. Be sure that the copier's power plug remains disconnected during the work.
4. Be sure to identify the screws by type (length, diameter) and location.
5. Be sure to prepare settings data for the unit on the computer at the service station (for remote control only).

1) Remove the four screws 2, and remove the face plate 1 of the copier's rear cover.

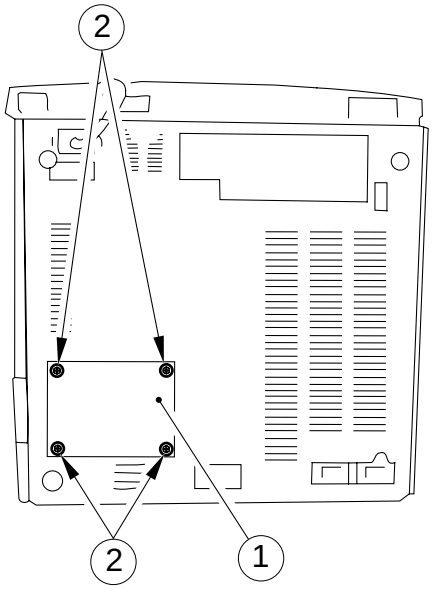

Figure 5-506

2) Cut the tie-wrap 3, and connect the 8P connector 4 of the unit and the 8P connector 5 of the copier.

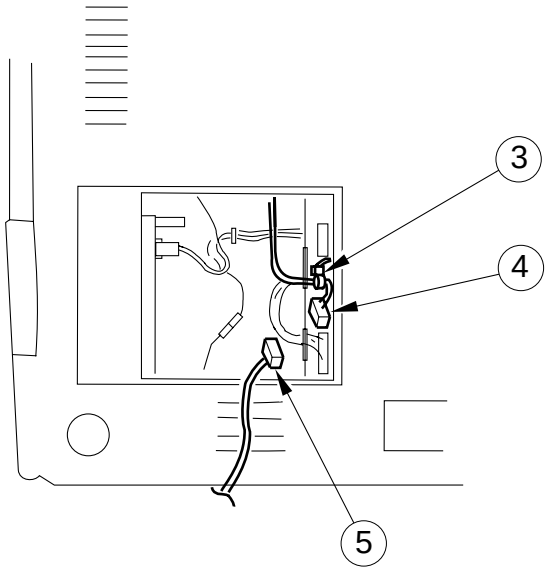

Figure 5-507

3) Fix the unit 6 in place on the copier's rear cover using four screws.

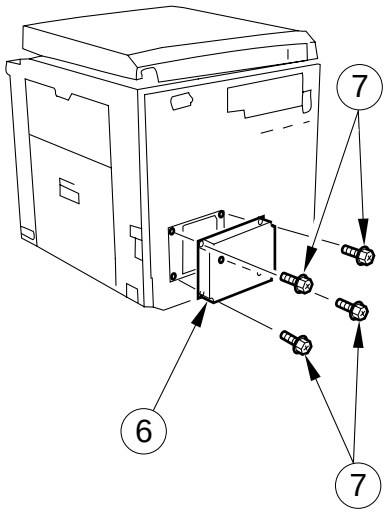

Figure 5-508

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3. Checking the Operations

1) If you are not connecting the Communication Control Board-A1 or the Interface Board-B1 (not requiring the Power Supply-A1), go to step 4).
Connect the connector 1 of the Power Supply-A1 to the connector 2 of the Copy Data Controller-A1 securely as indicated.
Check to make sure that the cord is in the groove of the board.

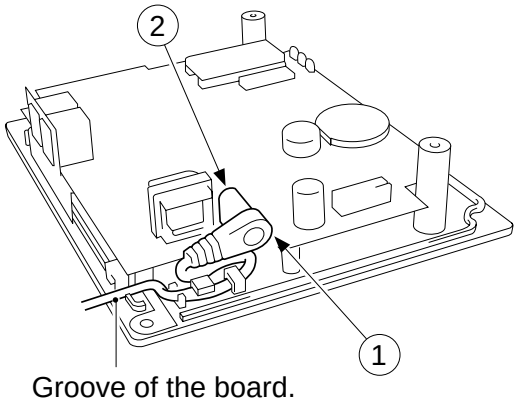

Figure 5-509

2) Connect the Power Supply-A1 to the power plug, and check to make sure that LED1 of the Copy Data Controller-A1 turns ON.

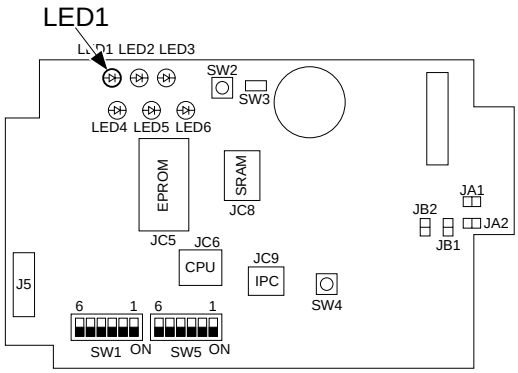

Figure 5-510

3) Turn ON the copier's main switch, and check to make sure that LED2 of the Copy Data Controller-A1 flashes.
Make a copy, and check to make sure that LED3 flashes during copying operation.

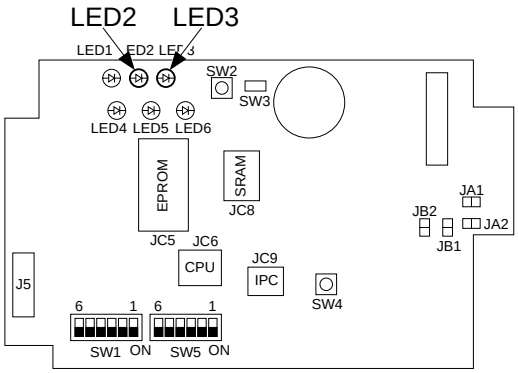

Figure 5-511

4) To connect the Communication Board-A1 or the Interface Board-B1 (requiring the Power Supply-A1), go to step 5).
Turn ON the copier's main switch, and check to make sure that LED1 turns ON and LED2 flashes.
Make a copy, and check to make sure that LED3 flashes during copying operation.

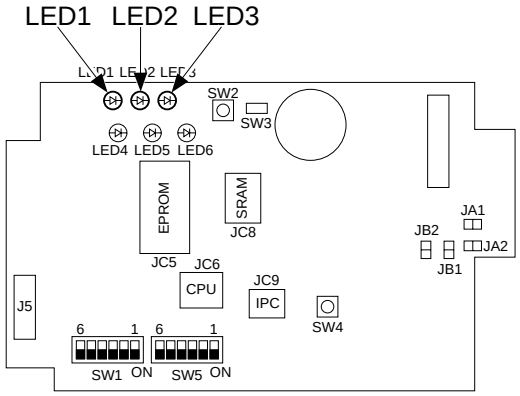

Figure 5-512

5) If group control is not to be used, go to step 11).
If group control is to be used, set the input method, control type, and paper size to suit the needs of the user.
Set bit 3 of the DIP switch (SW5) on the Copy Data Controller to ON.

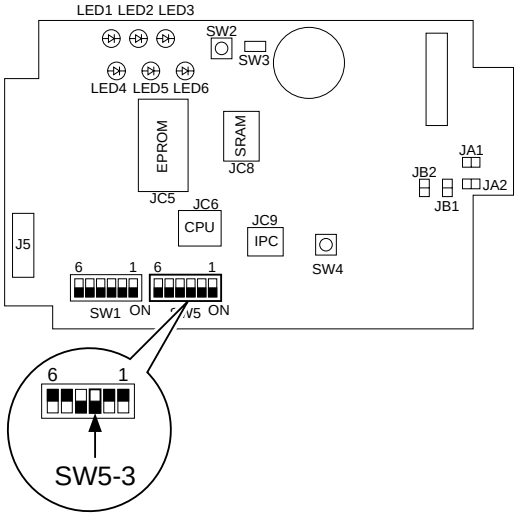

Figure 5-513

6) Connect the connector 3 of the Keypad-A1 to the connector (J3) 4 of the Coy Data Controller-A1.

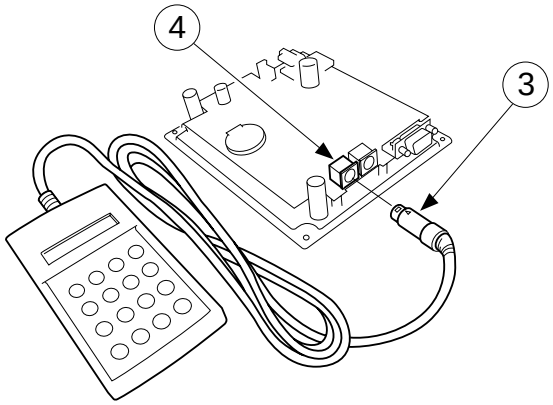

Figure 5-514

7) Press the switch (SW2) on the Copy Data Controller-A1 to start service mode.

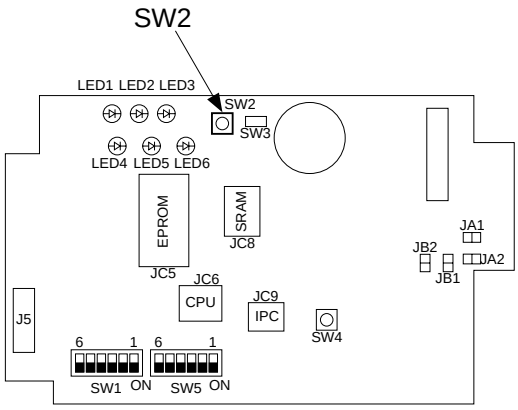

Figure 5-515

8) Make settings as follows:

8-1) Select card/ID input using the Keypad-A1. (Initially, card input.)

8-2) To change from card input to ID input, perform the following using the Keypad-A1.
To change from ID input to card input (requires the Card Reader-A1), go to 8-4).
MANAGE=CARD will be indicated.

8-3) Press the 2 key, and press the ENT key.
MANAGE=ID will be indicated.

8-4) To change to card input, press the 1 key after MANAGE=ID has appeared; then, press the ENT key.
MANAGE=CARD will appear.

Code	Input method
1	Card
2	ID

Table 5-502

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Caution:

1. If you set bit 4 of the DIP switch (SW5) on the Copy Data Controller-A1 to OFF, group control will not be executed and the notation will be as follows:

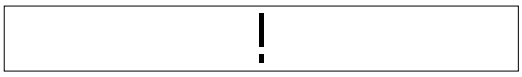

Figure 5-516

2. If the copier has been used for ID input (using its own memory), the registered ID numbers may be used for the Copy Data Controller-A1 by performing the following:

a) Set the DIP switch (SW1) on the Copy Data Controller-A1 as follows:

	Bit	Position
SW1	1, 2	ON
	3	OFF

Table 5-503

b) Press the switch (SW4) of the Copy Data Controller-A1.
LED5 will turn ON momentarily in response to a press on the switch (SW4).

c) LED5 will turn ON when the data has been drawn out.
If the attempt to draw out the data has failed, LED5 will start to flash; if such is the case, press the switch (SW4) once again, and check that LED5 flashes.
The copier cannot discharge paper while data is being drawn.

d) Set the DIP switch (SW1) of the Coy Data Controller-A1 as shown. (LED5 remains OFF.)

	Bit	Position
SW1	1, 2, 3	OFF

Table 5-504

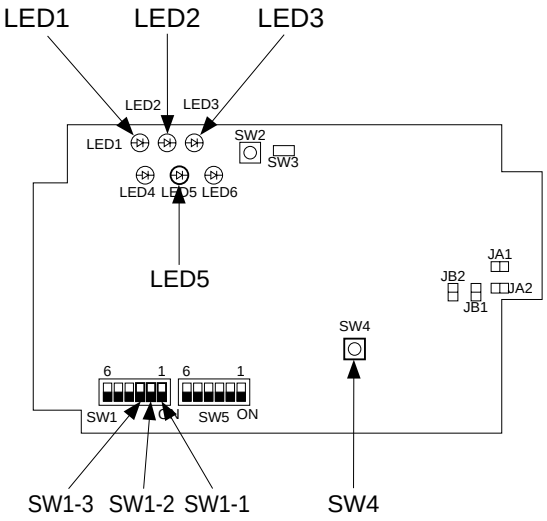

Figure 5-517

9) Select the appropriate control type as follows:
9-1) Set the control type using the Keypad-A1.
Press ▽/△ so that FORMAT=1 appears.
9-2) Set the control type number to suit the type of copier and the needs of the user by referring to Table 5-505.

No.	No. of groups	Paper size	Mode
1	3000	5	–
2	1000	5	One-sided /two-sided
3	1000	5	Mono /2-color /full-color

Table 5-505

9-3) To select '3' for control type,
1. FORMAT=1 appears. Since the initial setting is '1', change the control type number to '3'.
Press the 3 key.
To clear the input value, press the C key, and try again.
2. When FORMAT=3_ has appeared, press the ESC key.
3. When FORMAT=3_ has appeared, press the ESC key.
3. FORMAT=3_ appears, and the cursor flashes for a while during formatting. The control type will be set to '3' when the flashing stops.

Caution:
Setting a new control type number will clear the unit price, upper limit value, counter reading, and ID number, requiring you to re-enter them.

10) Set the control paper size as follows:
10-1) Change the control paper size using the DIP switch on the Copy Data Controller-A1 and the Keypad-A1.
To continue to use the existing control paper, go to step 11).
10-2) Press the ▽/△ key to scan through the paper sizes. ('OTH', however, will not appear, since it cannot be changed.)

EX 1
1. SIZE 1 =A3 appears.
2. Press the ▽ key.
3. SIZE 2 =A4 appears.
4. Press the ▽ key.
5. SIZE 3 =B4 appears.
6. Press the ▽ key.
7. SIZE 4 =B5 appears.
8. Press the △ key.
9. SIZE 3 =B4 appears.
10. Press the △ key.
11. SIZE 2 =A4 appears.

EX 2 Changing B4 to LGL for Control Paper Size 3
1. Press the ▽/△ key so that SIZE 3 =B4 appears.
2. Find the size for LGL from the conversion code table (Table 5-506), and press 1 and 3.
3. SIZE 3 =13 appears.
4. Press the ENT key.
5. SIZE 3 =LGL appears to end the change.

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Caution:

1. For sizes 1-4, you cannot set the same paper size code.
2. The counter reading will not be cleared by changing the size.

10-3) Check the conversion code.

Size	Code	Size	Code
B5	1	Postcard (Jpn)	1
FOOLS	2	U LARGE 2	2
A4	3	GLTR	3
B4	5	10X8	5
A3	7	GLGL	7
U SMALL (US)	8	KLGL	8
STMT	9	OFFICIO	9
U LARGE (UL)	10	EOFFICIO	10
LTR	11	AOFFICIO	11
LGL	13	BOFFICIO	13
LDR (11X7)	15	ALTR	15
A5	17	ALGL	17
AFOOLS	18	12X18	18
A6	19	B3	19
FOLIO	21	A2	21
COMPUTER	23	17X22	23
U SMALL 2	24	18X24	24

Table 5-506

11) Check the DIP switch settings.

11-1) Shift bit 3 of the DIP switch (SW5) on the Copy Data Controller-A1 to OFF.

11-2) Press the ▽/△ key so that the setting of the DIP switch (SW1, SW5) on the Copy Data Controller-A1 appears.

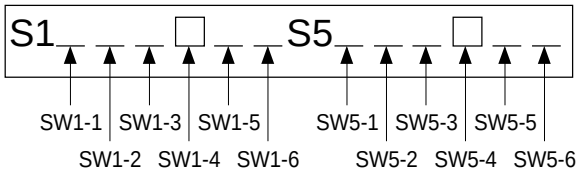

Figure 5-518

11-3) Check the setting of the DIP switch (SW1, SW5) on the Copy Data Controller-A1. (See Table 3-1.)

- If the setting is not correct,
  Return to "Setting the Board," and perform the appropriate steps once again.
- To set the Interface Board-B1, Interface Board-A1, or communication Control Board-A1 as an option, see the Installation Procedure of the respective board.

11-4) Press the switch (SW2).

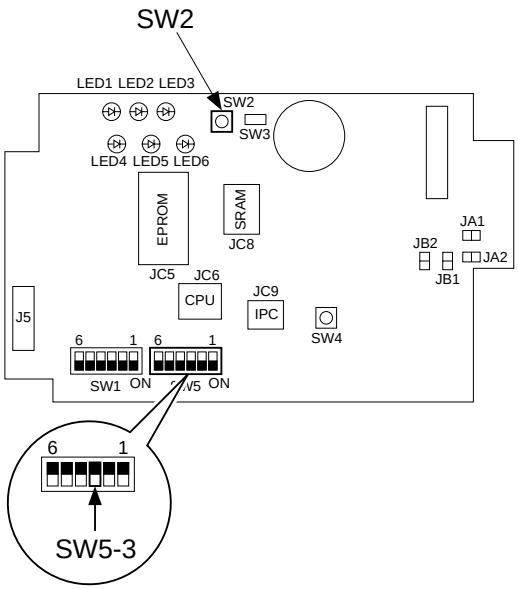

Figure 5-519

11-5) Check to make sure that the notation of the Keypad-A1 is as follows, and disconnect the Keypad-A1.

Figure 5-520

12) Attach the switch settings label to the upper cover 5; then, record the setting of each switch on the label.

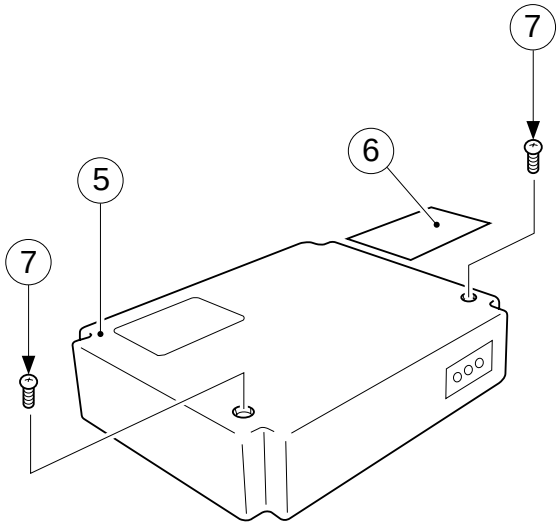

Figure 5-521

13) Fix the upper cover in place using two screws 7.
When doing so, make sure that the cable of the power supply unit is held in position on the cable guide inside the unit, and it is not trapped by the upper cover.

14) To connect the Control Card Printer A-1, connect it to the connector (J4) of the Copy Data Controller-A1. (As necessary, use a relay cable.)

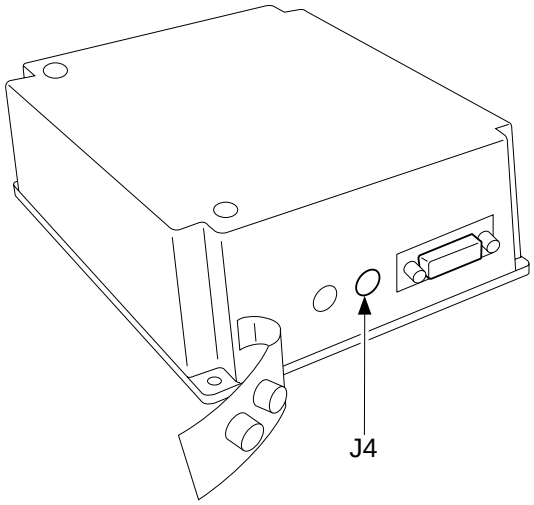

Figure 5-522

15) If the entire length of the cable is inside the Copy Data Controller-A1, end the work.
Attach the petty-pull 8 on the right bottom of the copier's rear.

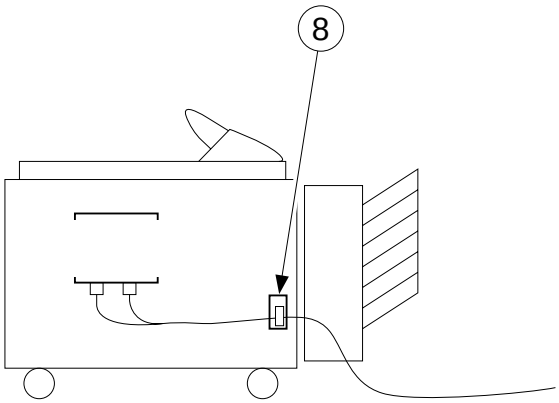

Figure 5-523

16) Fix the cable connected to the Copy Data Controller-A1 to the petty-pull.

17) Check to make sure that the cable is not trapped by the casters of the copier or the sorter.

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CHAPTER 6

MAINTENANCE AND SERVICING

I. PERIODICALLY REPLACED PARTS 6-1
II. CONSUMABLES AND DURABLES 6-1
III. SCHECULED SERVICING CHART 6-2
IV. SCHEDULED SERVICING 6-4

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I. PERIODICALLY REPLACED PARTS

The machine does not have parts that must be replaced on a periodical basis.

II. CONSUMABLES AND DURABLES

Some parts of the machine may have to be replaced once or more over the period of warranty because of deterioration or wear. Replace them as necessary.

No.	Parts	Parts No.	Q'ty	life (copies)	Remarks
1	Lower fixing separation claw	FB1-7275-000	4	100,000	
2	Separation static eliminator	FF5-4467-000	1	100,000	
3	Fixing assembly	FG5-6261-000	1	200,000	100V
		FG5-6325-000	1	200,000	120V
		FG5-6326-000	1	200,000	230V
4	(fixing cleaning roller)	FB3-3068-000	1	200,000	Included in fixing assembly.
5	(lower fixing roller)	FB3-3064-000	1	200,000	Included in fixing assembly.
6	Scanning lamp	FH7-3314-000	1	200,000	
7	Transfer charging roller	FF5-4565-000	1	200,000	
8	Pick-up/feeding roller	FF5-4552-000	4	100,000	Actual copies used for
9	Separation roller	RF5-1426-000	2	200,000	Actual copies used for
10	Manual feed separation pad	FC1-9022-030	1	200,000	
11	Pre-exposure lamp	FG5-6297-000	1	200,000	
12	Developing cylinder	FG5-6222-000	1	400,000	100V
		FG5-8705-000	1	400,000	120V, 230V

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III. SCHEDULED SERVICING CHART

Note:
1. Provide scheduled servicing every 100,000 copies.
2. Check the service book before setting out for a visit; take parts if replacement is expected.

Step	Work	Checks	Remarks
1	Meet the person in charge.	Check the general condition.	
2	Record the counter reading.	Check the faulty copies	
3	Make test copies.	Check the following: a. Image density b. Background (for soiling) c. Characters (for clarity) d. Leading edge margin (Note) e. Fixing, registration, back (for soiling) f. Counter operation	**Note:** Standards: 2.5 ±1.0 mm
4	Clean the optical assembly: • Scanning lamp reflecting plate • Lens • No. 1, No. 2, No. 3 mirror • Dust-proofing glass • Standard white plate		Use a blower brush; if the dirt cannot be removed, use alcohol. Dry wipe the standard white plate.
5	Clean the transfer guide: • Transfer guide (upper/lower) plate • Transfer charging assembly guide rail		Remove the drum unit for work.
6	Clean the separation/feeding assembly: • Separation static eliminator • Feeding belt		
7	Clean the fixing/delivery assembly: • Fixing assembly inlet guide • Lower separation claw		
8	Provide scheduled servicing (p. 6-4) according to the number of copies made.		

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Step	Work	Checks	Remarks
9	Clean the copyboard glass.		
10	Make test copies.		
11	Perform the Image Adjustment Basic Procedure.		
12	Make sample copies.		
13	Put the sample copies in order, and clean up the area around the machine.		
14	Record the final counter reading.		
15	Fill out the service book, and report to the person in charge.		

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IV. SCHEDULED SERVICING

Caution:
Do not use solvents or oils not indicated.

△ :Clean ● :Replace × :Lubricate ◎ :Inspect

Unit	Part	Interval	Remarks
		100,000 copies	
Scanner drive assembly	Scanner rail	×	Lubricant
Feeding assembly	Feeding belt	△	
	Feeding assembly base	△	
	Transfer guide	△	
Optical assembly	Scanning lamp reflecting plate	△	
	No. 1 through No. 3 mirrors	△	
	Lens	△	
	Original size sensor	△	
	Dust-proofing glass	△	
Developing assembly	Developing roll	△	
Fixing assembly	Fixing assembly inlet guide	△	
	Lower separation claw	●	

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APPENDIX

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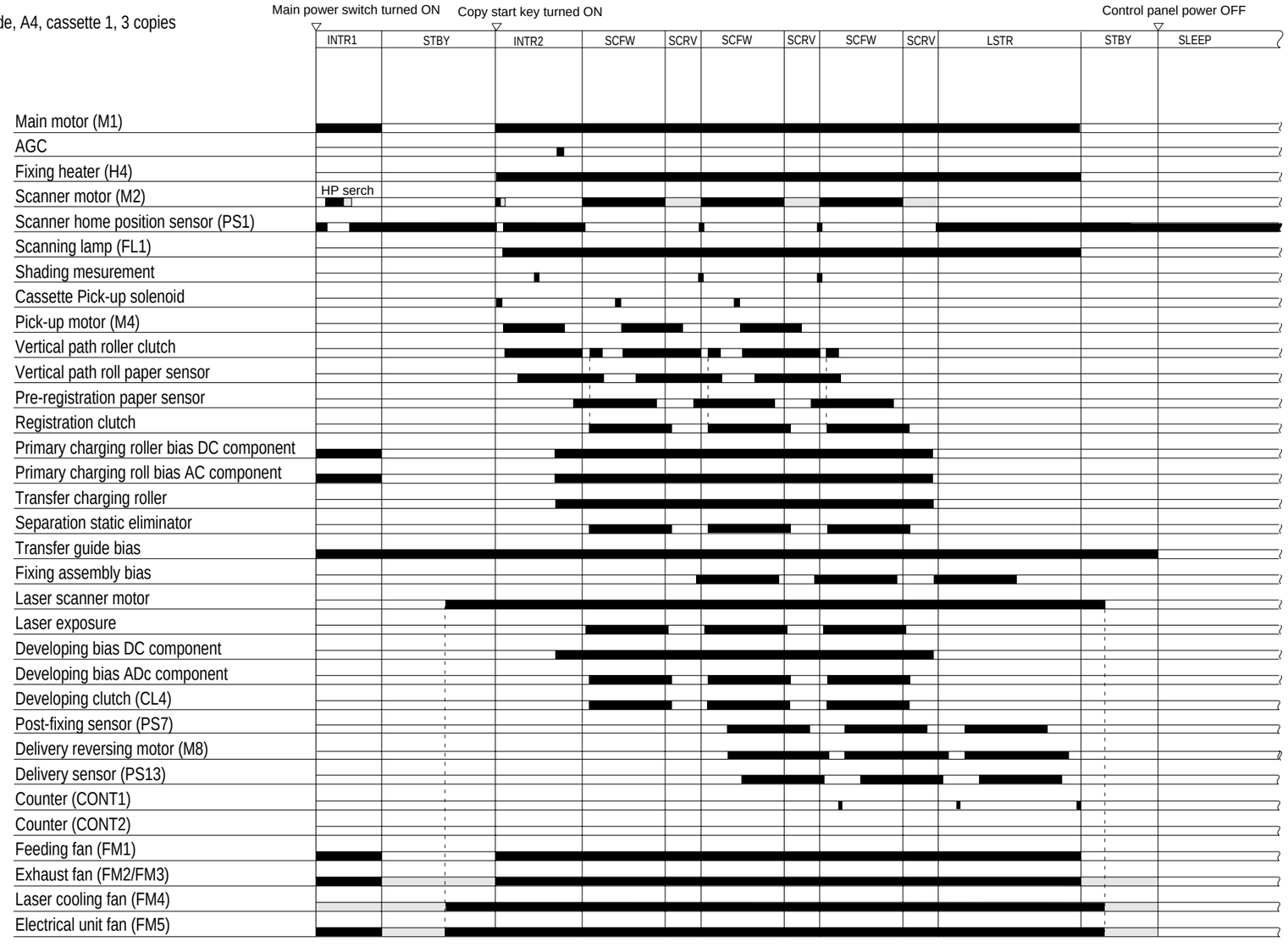
A. GENERAL TIMING CHART

• copier mode, A4, cassette 1, 3 copies

General Timing Chart

• copier mode, A4, cassette 1, 3 copies



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B. SIGNALS AND ABBREVIATIONS

1. Signals

1RPD0	UPPER CASETTE PAPER DETECTION 0 signal
1RPD1	UPPER CASETTE PAPER DETECTION 1 signal
2RPD0	LOWER CASETTE PAPER DETECTION 0 signal
3RPD1	LOWER CASETTE PAPER DETECTION 1 signal
ACON	AC DEVELOPING BIAS DRIVE command
APCON	AUTO POWER CONTROL ON command
ASCNTP	ASSIST COUNTER PULSE signal
ASRXD	ASSIST RECEPTION DATA signal
ASTDX	ASSIST TRANSMISSION DATA signal
BD	BEAM DETECT signal
BKLTON	BACK LIGHT ON signal
CBCC	COPYBOARD COVER CLOSED signal
CCV CONNECT	CONTROL CARD CONNECT signal
CCV COUNT	CONTROL CARD COUNTER PULSE signal
CI	CALLING INDICATOR signal
CL3D	VERTICAL PATH ROLLER CLUTCH 3 DRIVE command
CL5D	ROLLER CLUTCH 5 DRIVE command
CNT1D	COUNTER DRIVE 1 command
CNT2D	COUNTER DRIVE 2 command
CNT3D	COUNTER DRIVE 3 command
CS10_D	UPPER CASETTE SIZE DETECTION signal 0
CS11_D	UPPER CASETTE SIZE DETECTION signal 1
CS12_D	UPPER CASETTE SIZE DETECTION signal 2
CS13_D	UPPER CASETTE SIZE DETECTION signal 3
CS14_D	UPPER CASETTE SIZE DETECTION signal 4
CS20_D	LOWER CASETTE SIZE DETECTION signal 0
CS21_D	LOWER CASETTE SIZE DETECTION signal 1
CS22_D	LOWER CASETTE SIZE DETECTION signal 2
CS23_D	LOWER CASETTE SIZE DETECTION signal 3
CS24_D	LOWER CASETTE SIZE DETECTION signal 4
DCH	DC DEVELOPING BIAS DRIVE command
DCON	DC DEVELOPING BIAS DRIVE command
DFLD	DELIVERY DEFLECTION SOLENOID DRIVE signal
DSZ1	DOCUMENT SIZE DETECTION signal 1
DSZ2	DOCUMENT SIZE DETECTION signal 2
DSZ3	DOCUMENT SIZE DETECTION signal 3
DSZ4	DOCUMENT SIZE DETECTION signal 4
DVCD	DEVELOPING CLUTCH DRIVE signal
FFD	FIXING FILM DETECTION command
FL_S	FLUORESCENT LAMP INTENSITY signal
FLPRTH	FLUORESCENT LAMP PRE THERMISTOR signal
FLPWM	FLUORESCENT LAMP PWM DRIVE command
FLTH	FLUORESCENT LAMP THERMISTOR signal
FMD 1	FAN1 (FM1) DRIVE command
FMD 2	EXHAUST FAN2 (FM2) DRIVE command
FMD 3	EXHAUST FAN3 (FM3) DRIVE command
FMD 4	FAN4 (FM4) DRIVE command
FMD 5	FAN5 (FM5) DRIVE command
FMD 6	FAN6 (FM6) DRIVE command
FS	FS signal
HTNG	HEATER NG signal
HTRD	HEATER DRIVE command
HVTM0	HIGH VOLTAGE TRANSFER MODE 0
HVTM1	HIGH VOLTAGE TRANSFER MODE 1
LCSPD	LOWER CASETTE PAPER DETECTION signal
LED ON	PILOT LED DRIVE command
LMD	LAZER SCANNER MOTOR DRIVE command
LOCK	LAZER SCANNER MOTOR LOCK signal
LOW DETECT	ONE TOUCH DIAL LOW DETECTION signal
LSRD	LASER DRIVE command
MFCK	MULTIFEEDER CLUTCH DRIVE signal
MFPD	MULTIFEEDER PAPER DETECTION signal
MFPW	MULTIFEEDER PAPER WIDTH signal
MMCK	MAIN MOTOR CLOCK signal
MMD	MAIN MOTOR DRIVE command
MRSD	MULTIFEED ROLLER SOLENOID DRIVE command
PCSD	PRIMARY CHARGING ROLLER CLEANING SOLENOID DRIVE command
PDP1	PAPER DETECTION signal 1
PDP3	PAPER DETECTION signal 3
PDP4	VERTICAL PATH PAPER DETECTION signal 4
PDP5	PAPER DETECTION signal 5
PDP6	PAPER DETECTION signal 6
PDP7	PAPER DETECTION signal 7
PEXP	PRE-CONDITIONING EXPOSURE LAMP LIT command
RDOD	RIGHT DOOR OPEN DETECTION signal
RFLD	REPICK UP ROLLER SECTION SOLENOID DRIVE signal
RGCD	REGIST CLUTCH DRIVE signal
RTEMP	DRUM TEMPERATURE DETECTION signal
SCHP	SCANNER HOME POSITION signal
SEBON	SEPARATION STATIC ELIMINATOR ON command
SH	SAMPLE HOLD signal
SL2D	SOLENOID DRIVE signal 2
SRGPD	SIDE REGISTRATION PAPER DETECTION signal
SW ON	ANTI-CONDENSATION HEATER SWITCH DRIVE command
SW0	LIGHT INTENSITY SW0
SW1	LIGHT INTENSITY SW1
TEP	TONER EMPTY signal
TH1	FIXING THERMISTOR 1 signal
TH2	FIXING THERMISTOR 2 signal
UCSPD	UPPER CASETTE PAPER DETECTION signal
UP DETECT	ONT TOUCH DIAL UP DETECTION signal
VPPD	CASETTE CERTICAL PATH PAPER DETECTION signal
WTDT	WASTE TONER DETECTION signal

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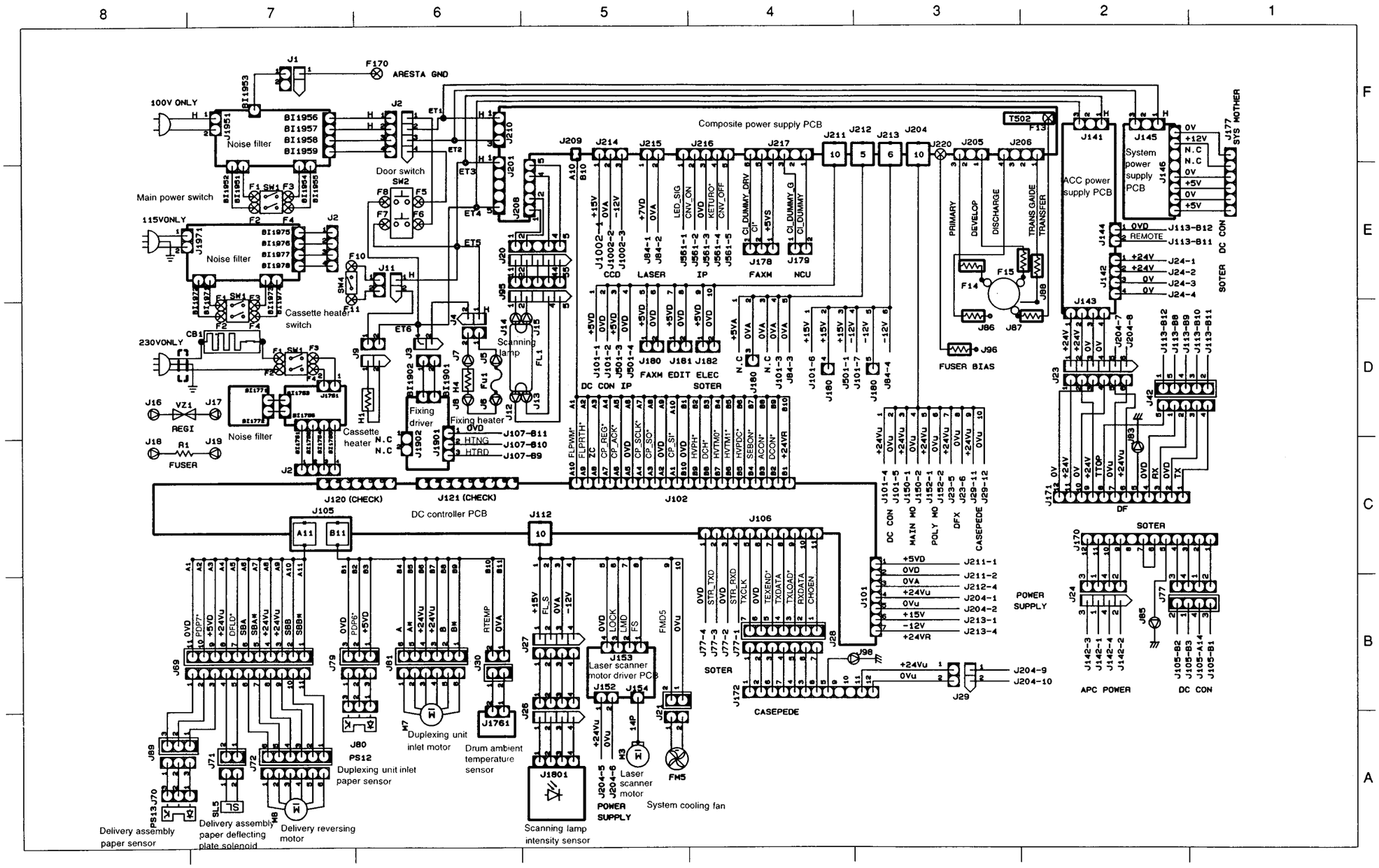
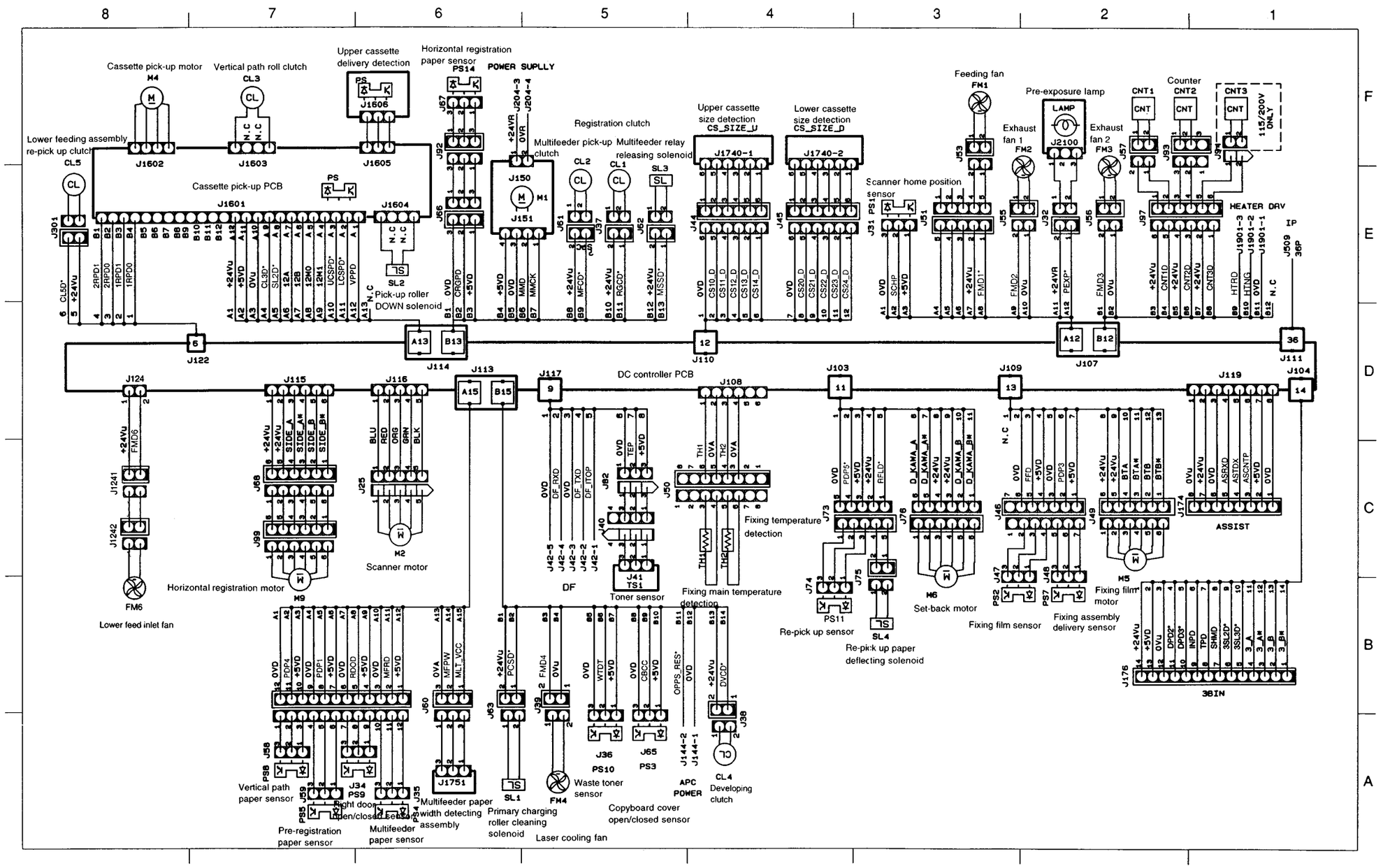
C. GENERAL CIRCUIT DIAGRAM

General Circuit Diagram (1/4)



General Circuit Diagram (2/4)



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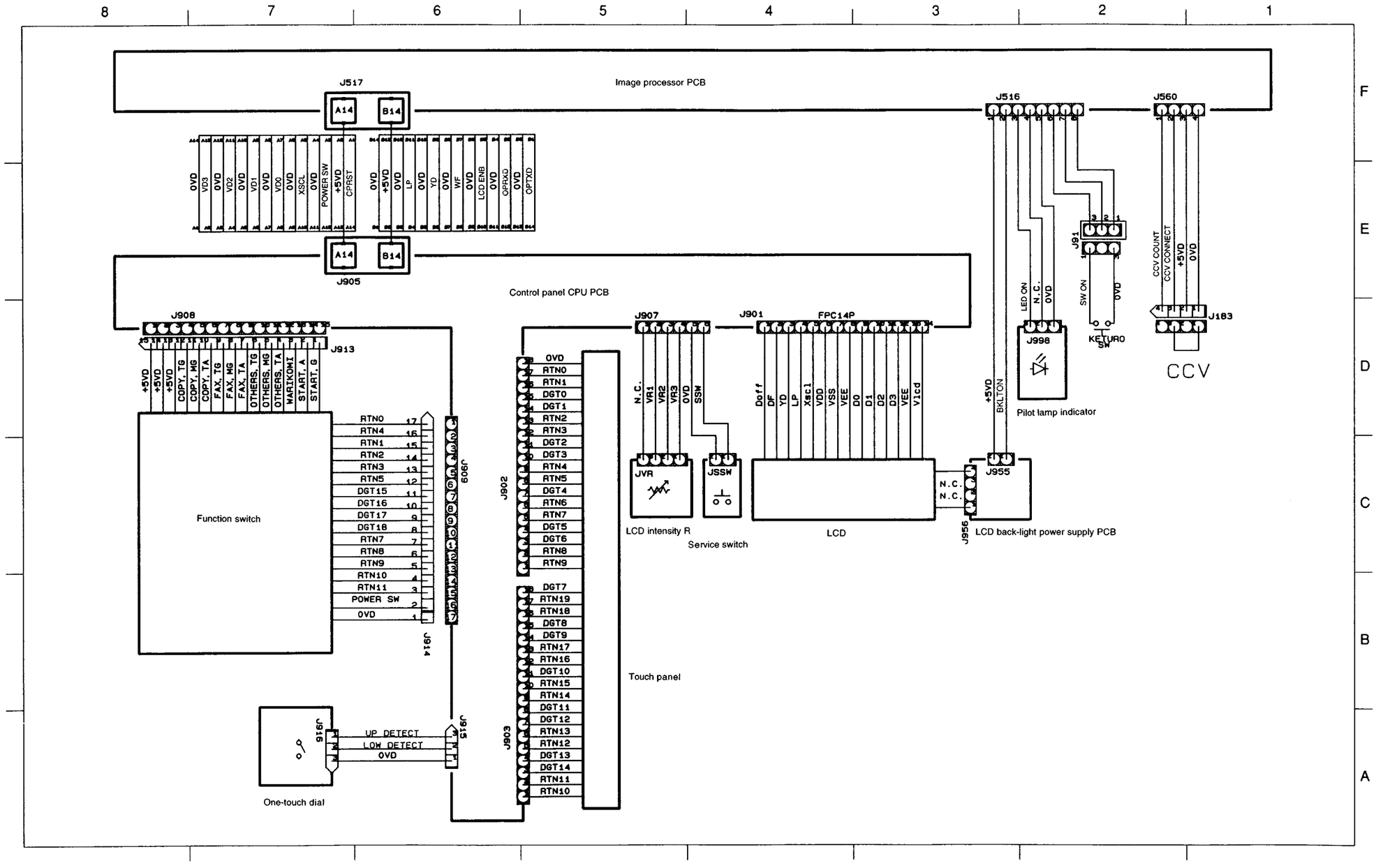

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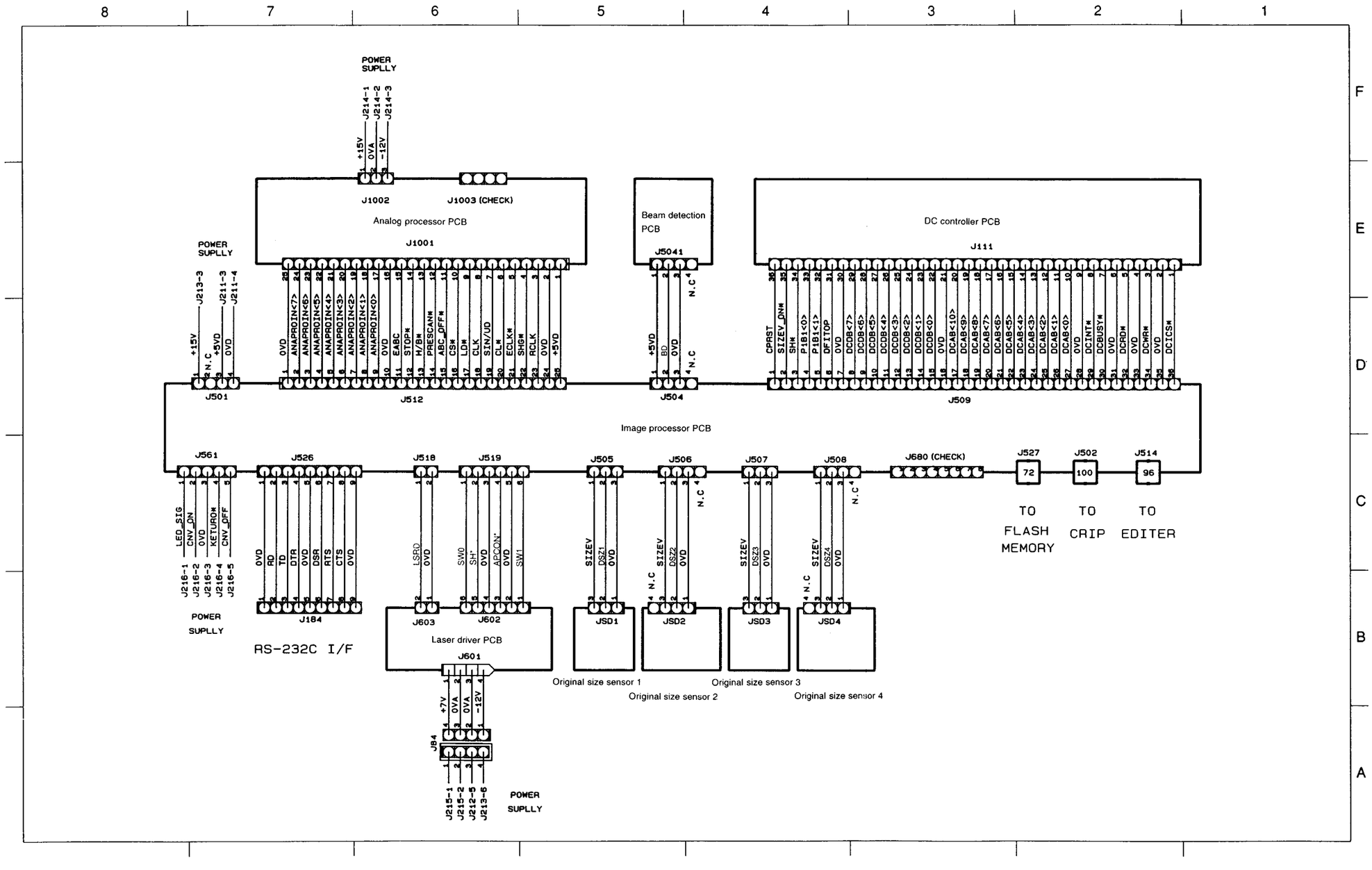
General Circuit Diagram (4/4)



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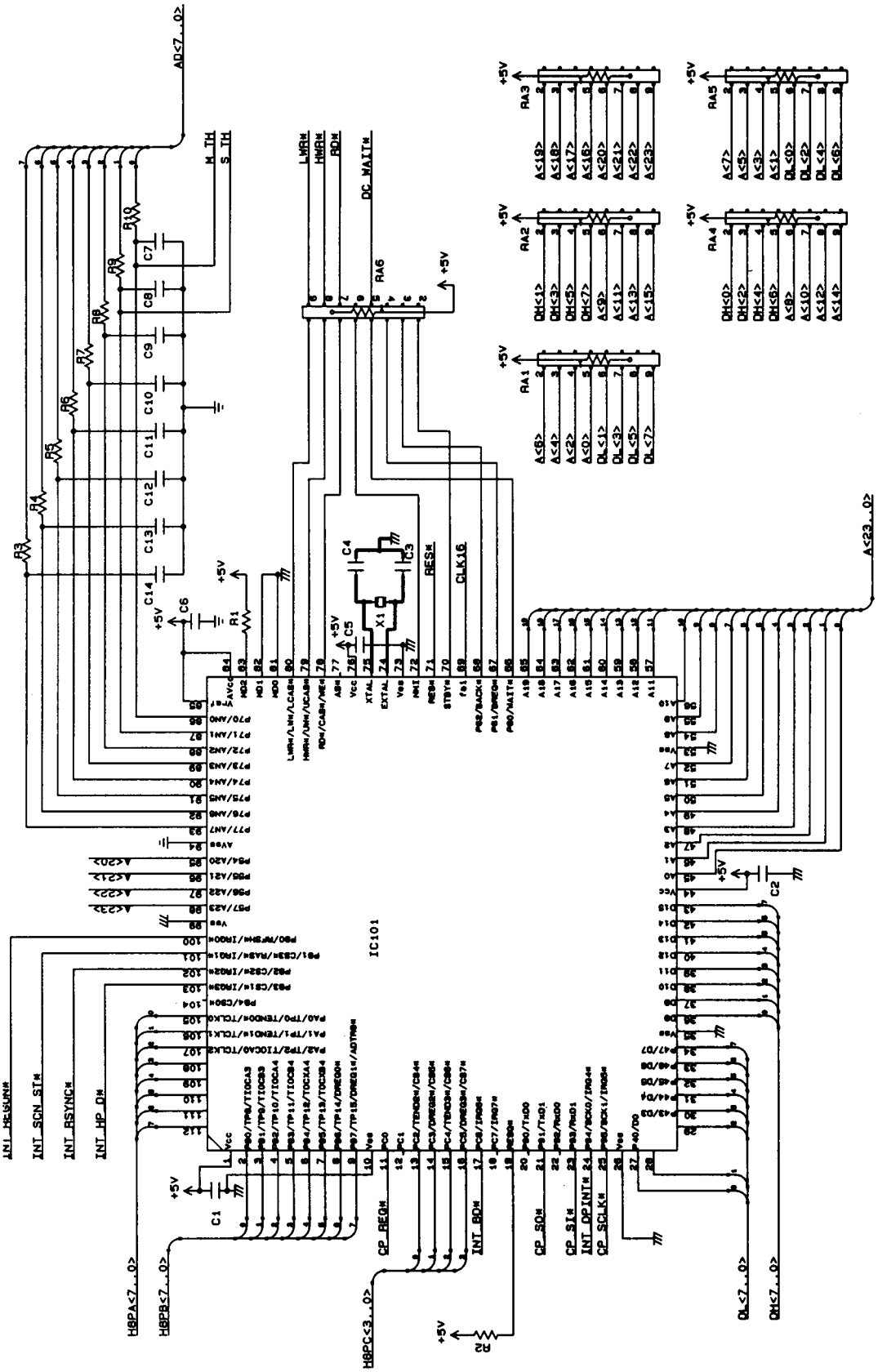
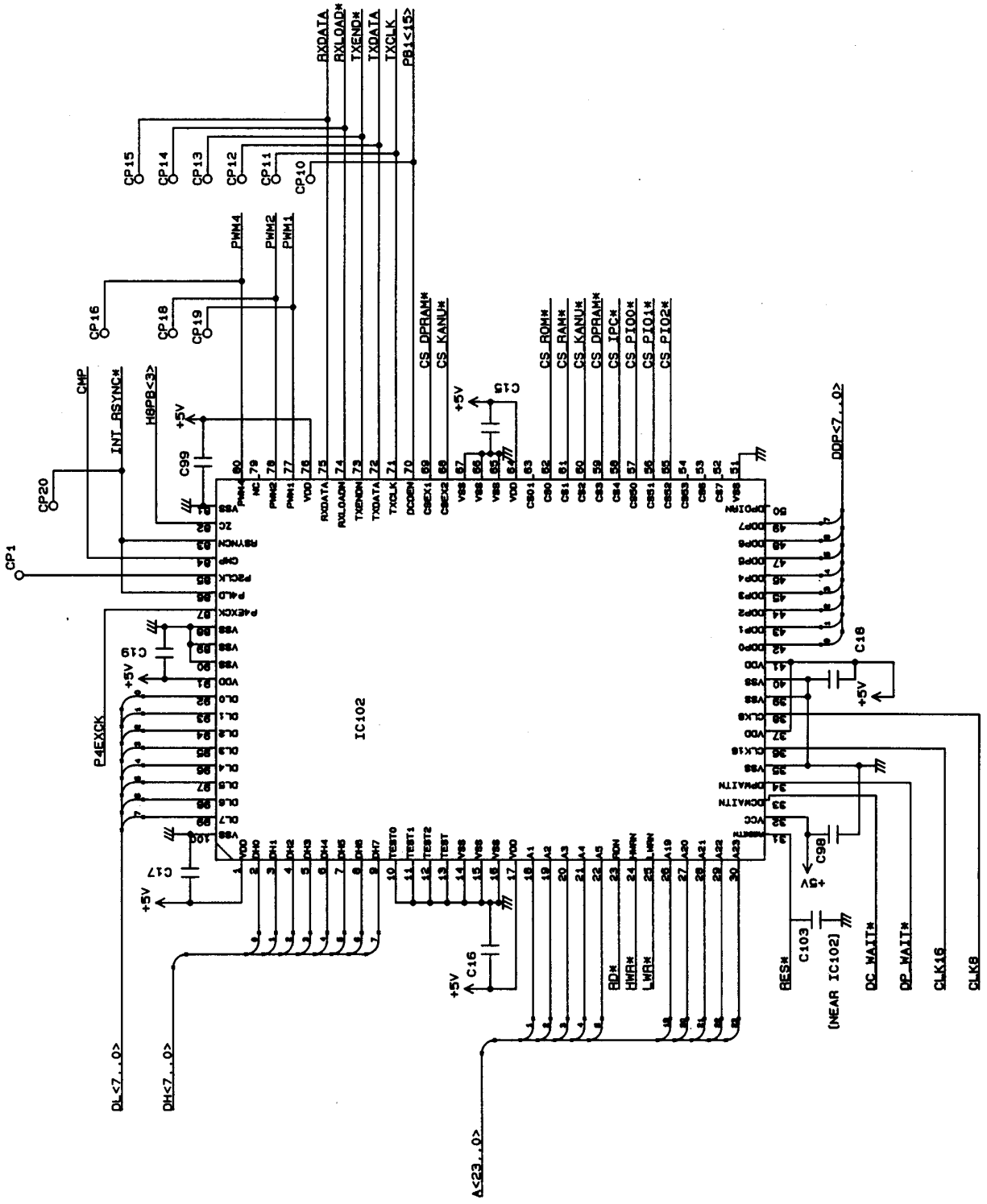
D. DC CONTROLLER CIRCUIT DIAGRAM

DC Controller Circuit Diagram (1/13)



DC Controller Circuit Diagram (2/13)



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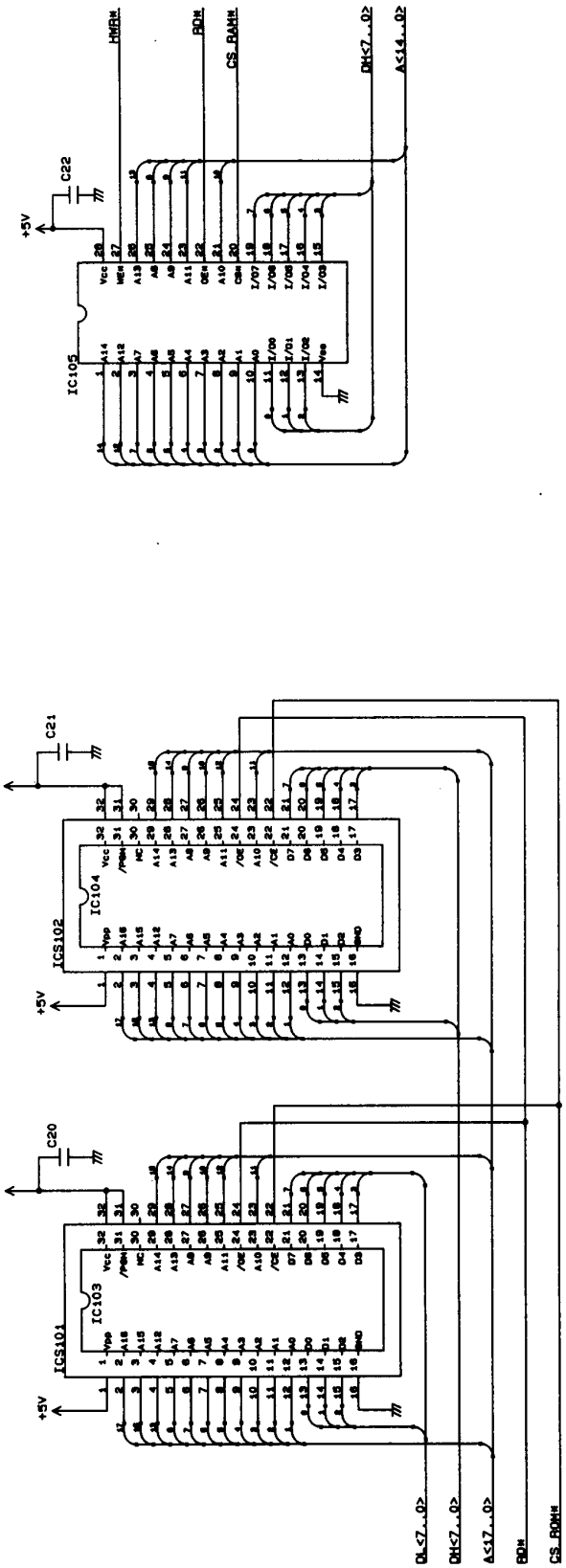
DC Controller Circuit Diagram (3/13)



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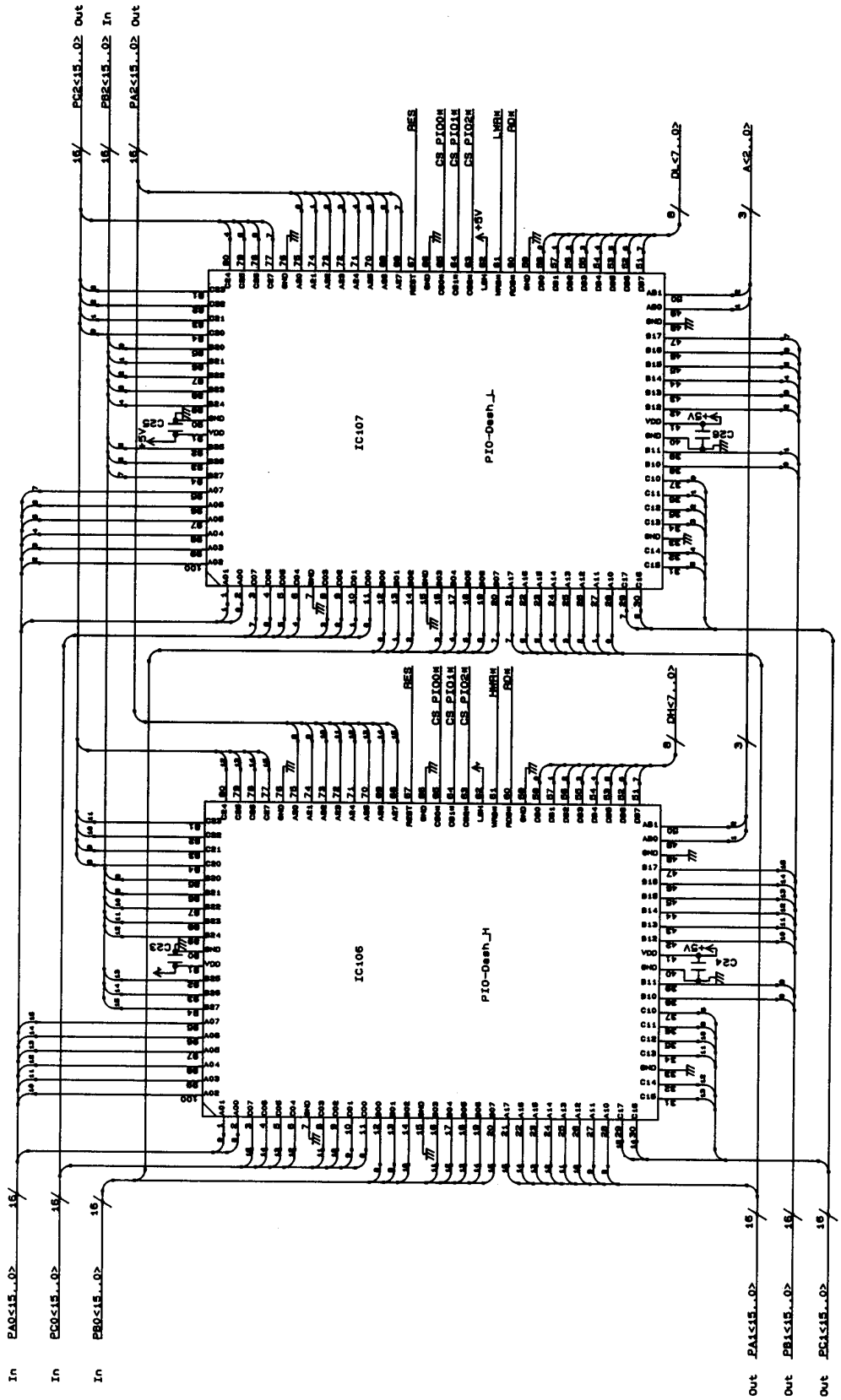
DC Controller Circuit Diagram (4/13)



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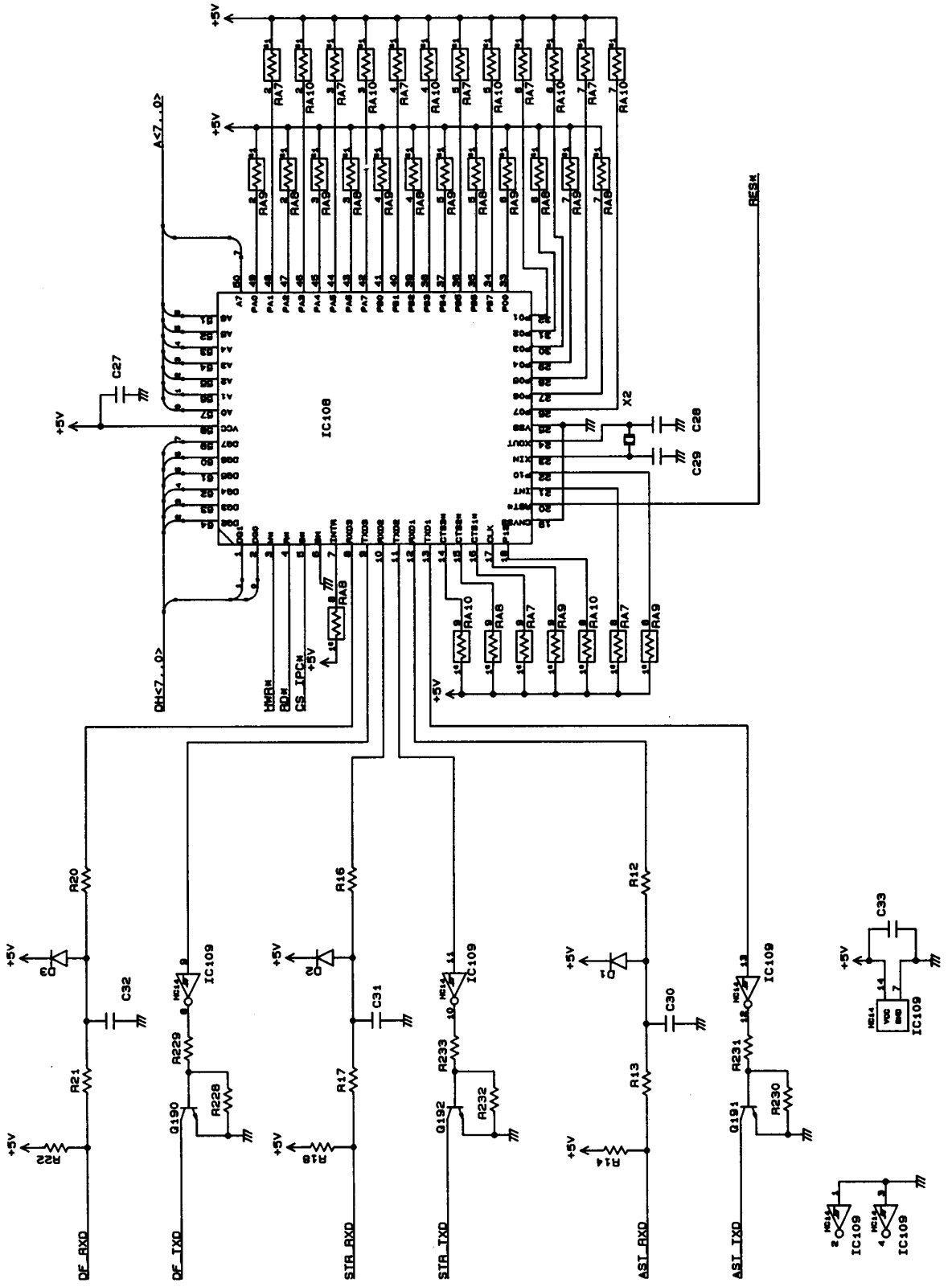
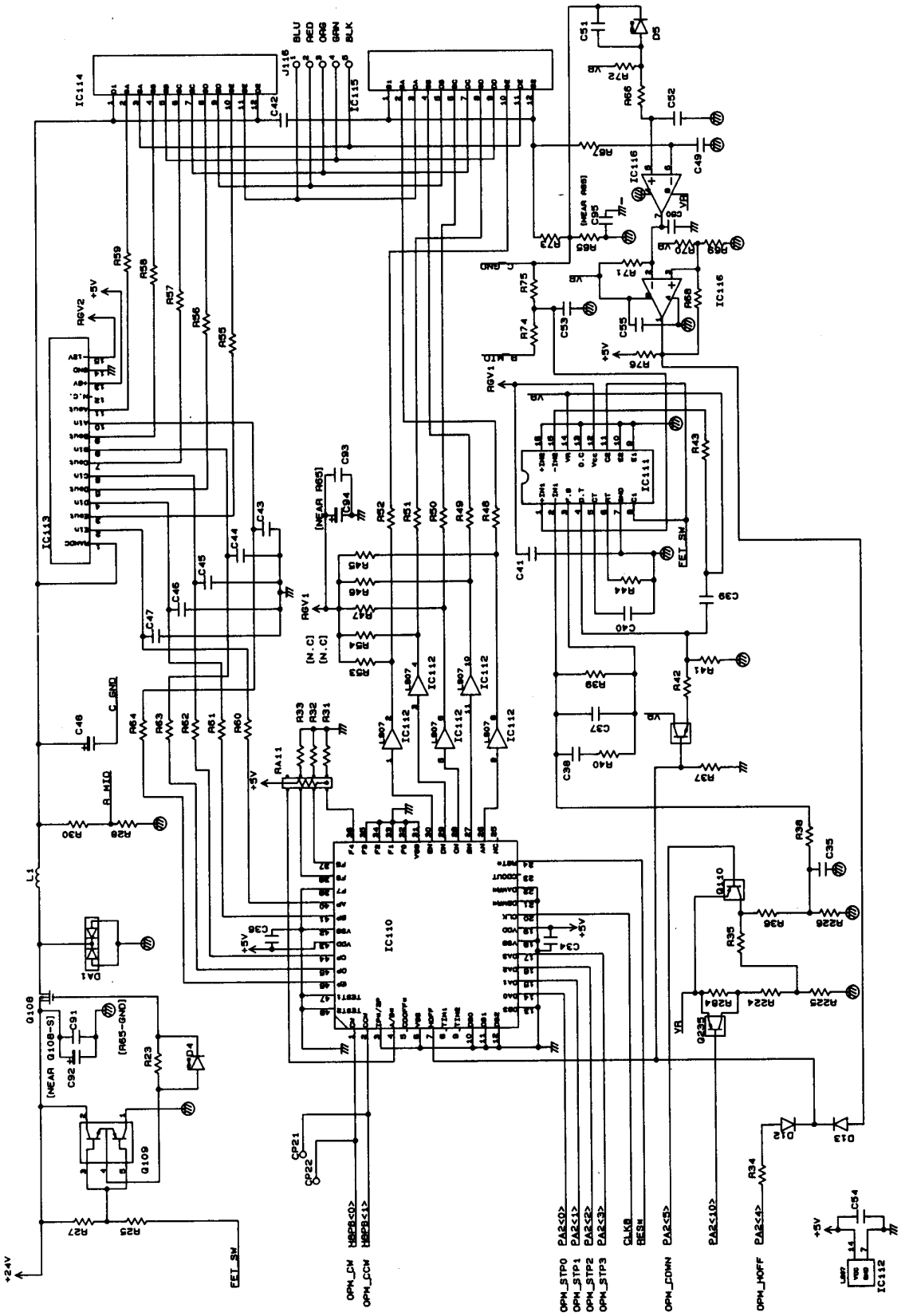
DC Controller Circuit Diagram (5/13)



DC Controller Circuit Diagram (6/13)



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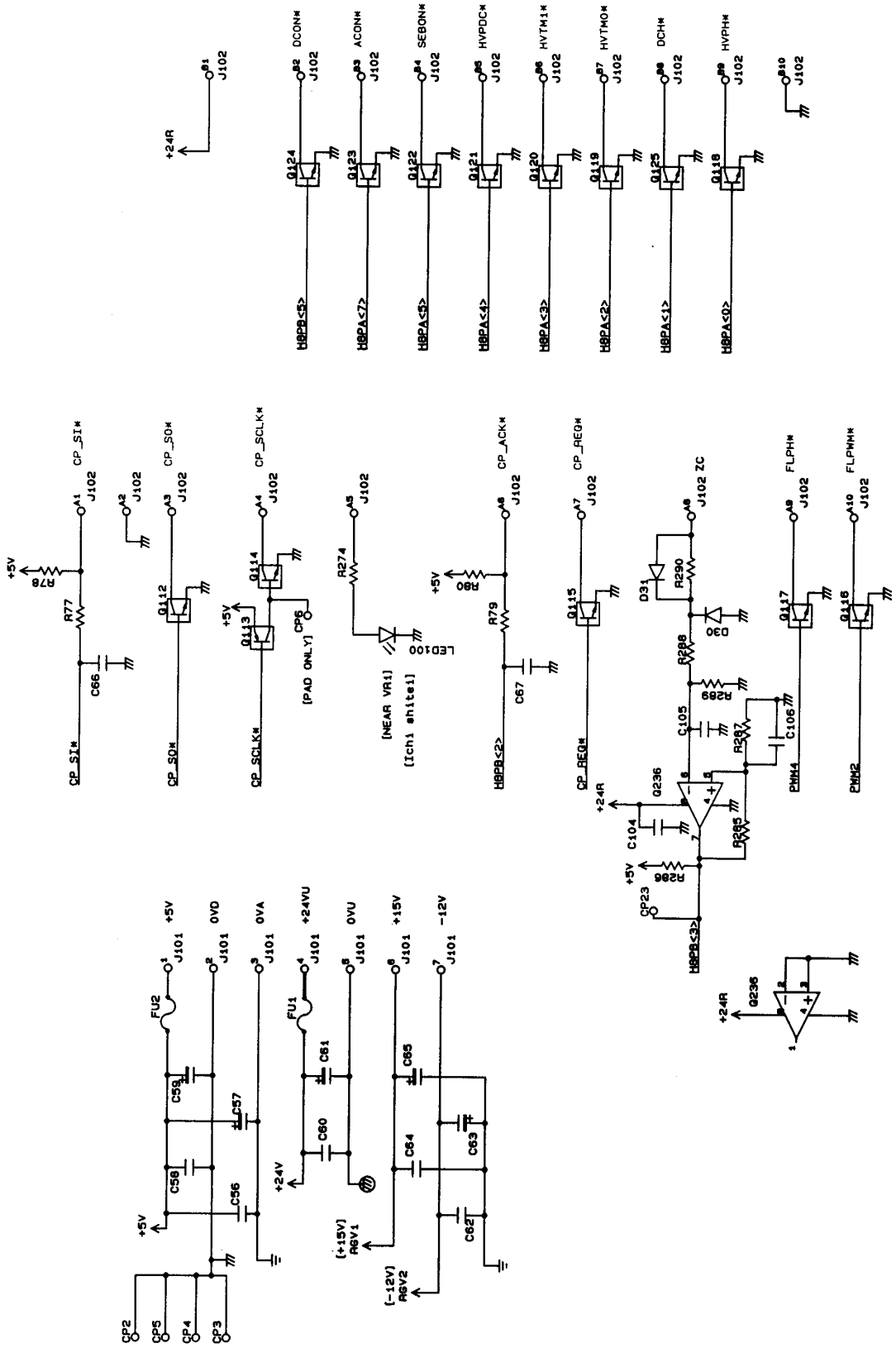
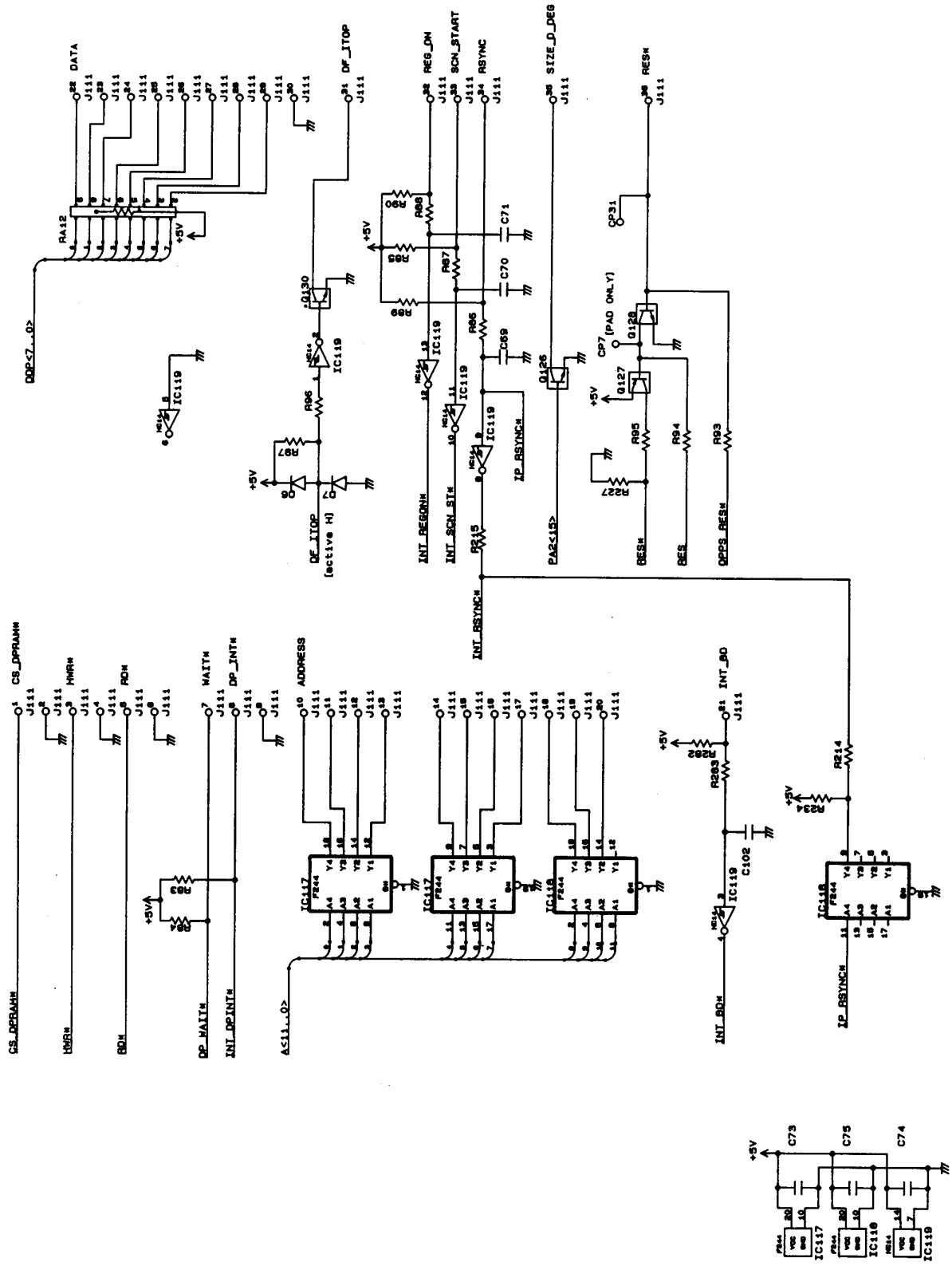
DC Controller Circuit Diagram (7/13)



DC Controller Circuit Diagram (8/13)



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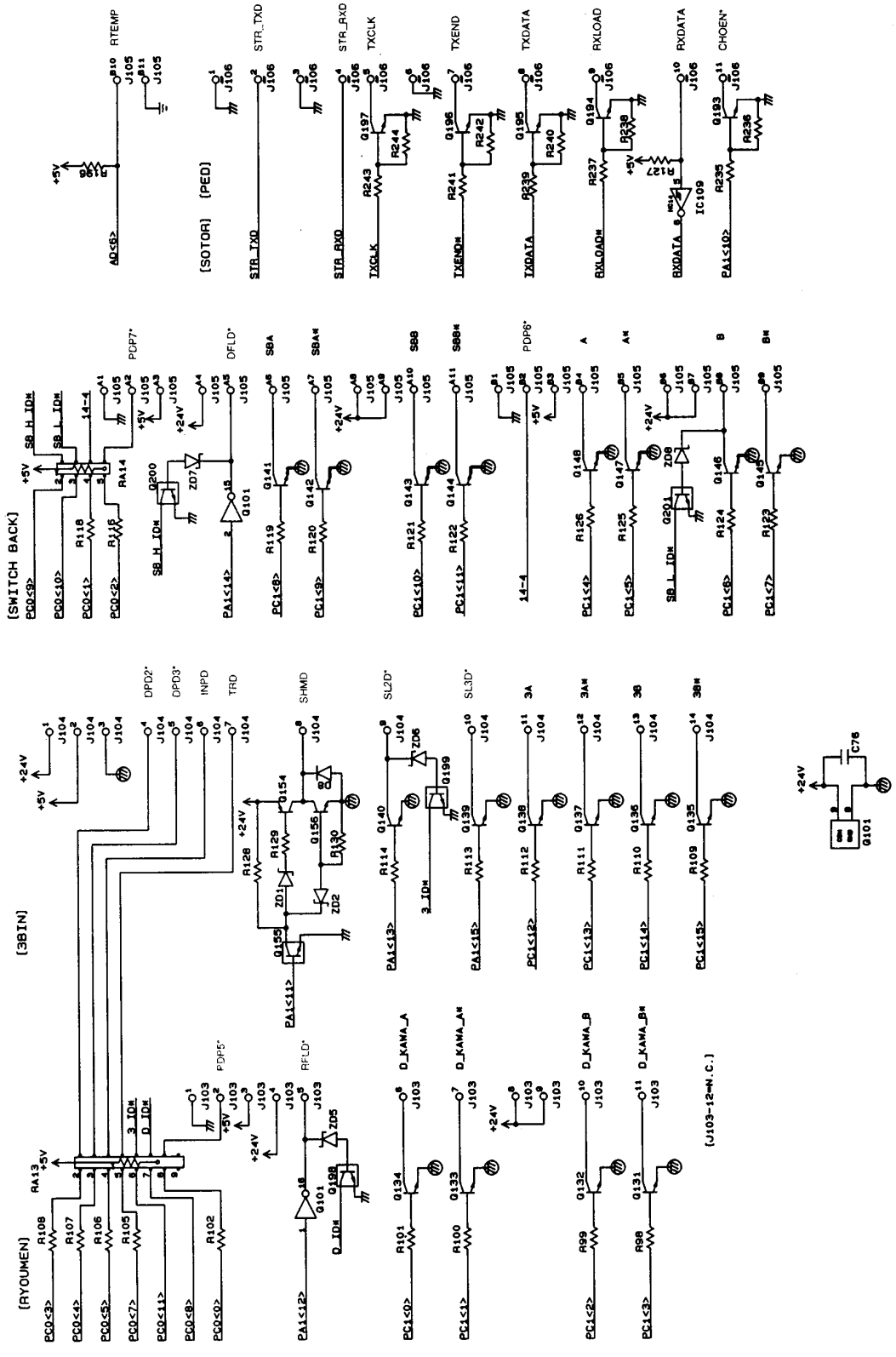
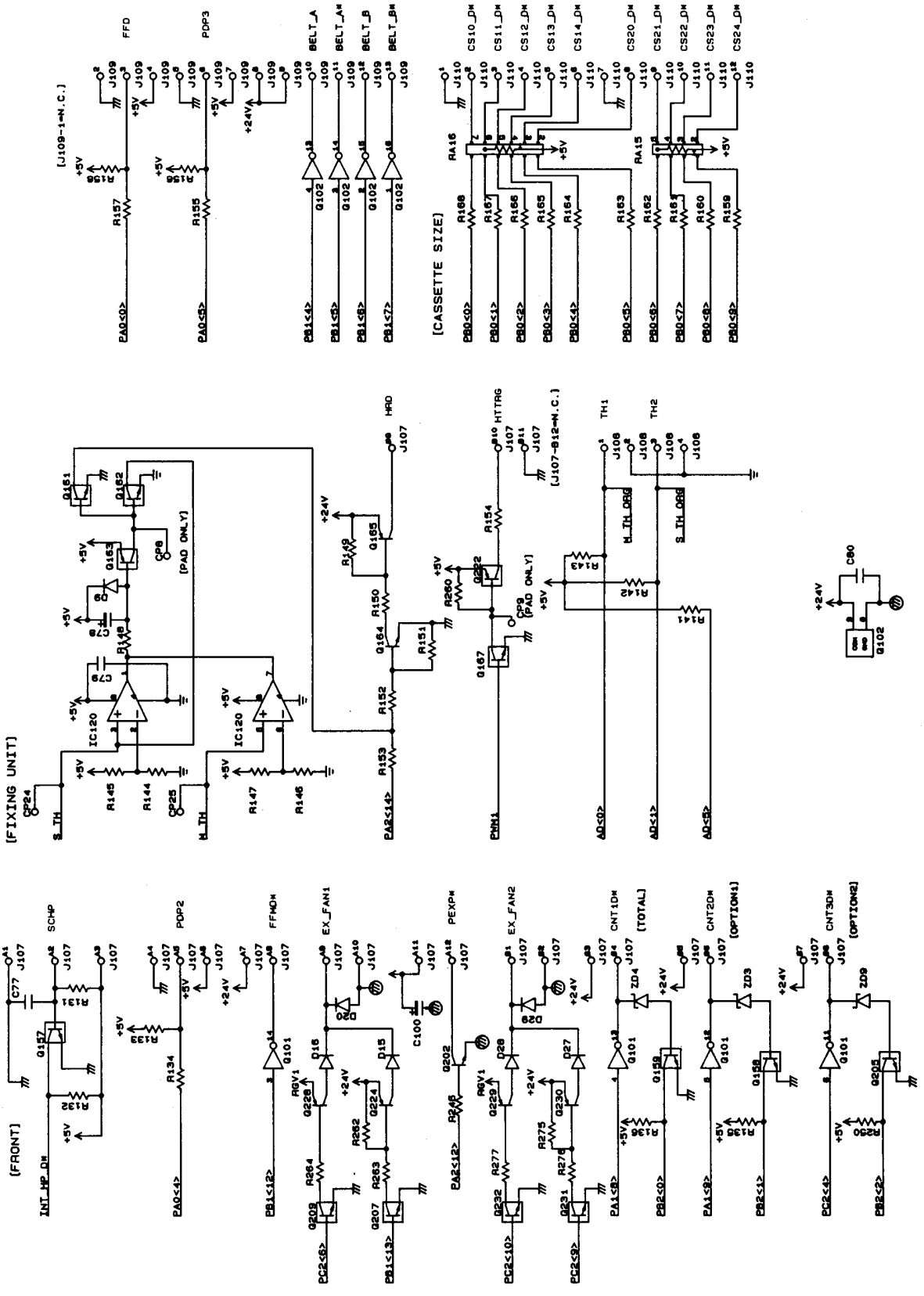
DC Controller Circuit Diagram (9/13)



DC Controller Circuit Diagram (10/13)



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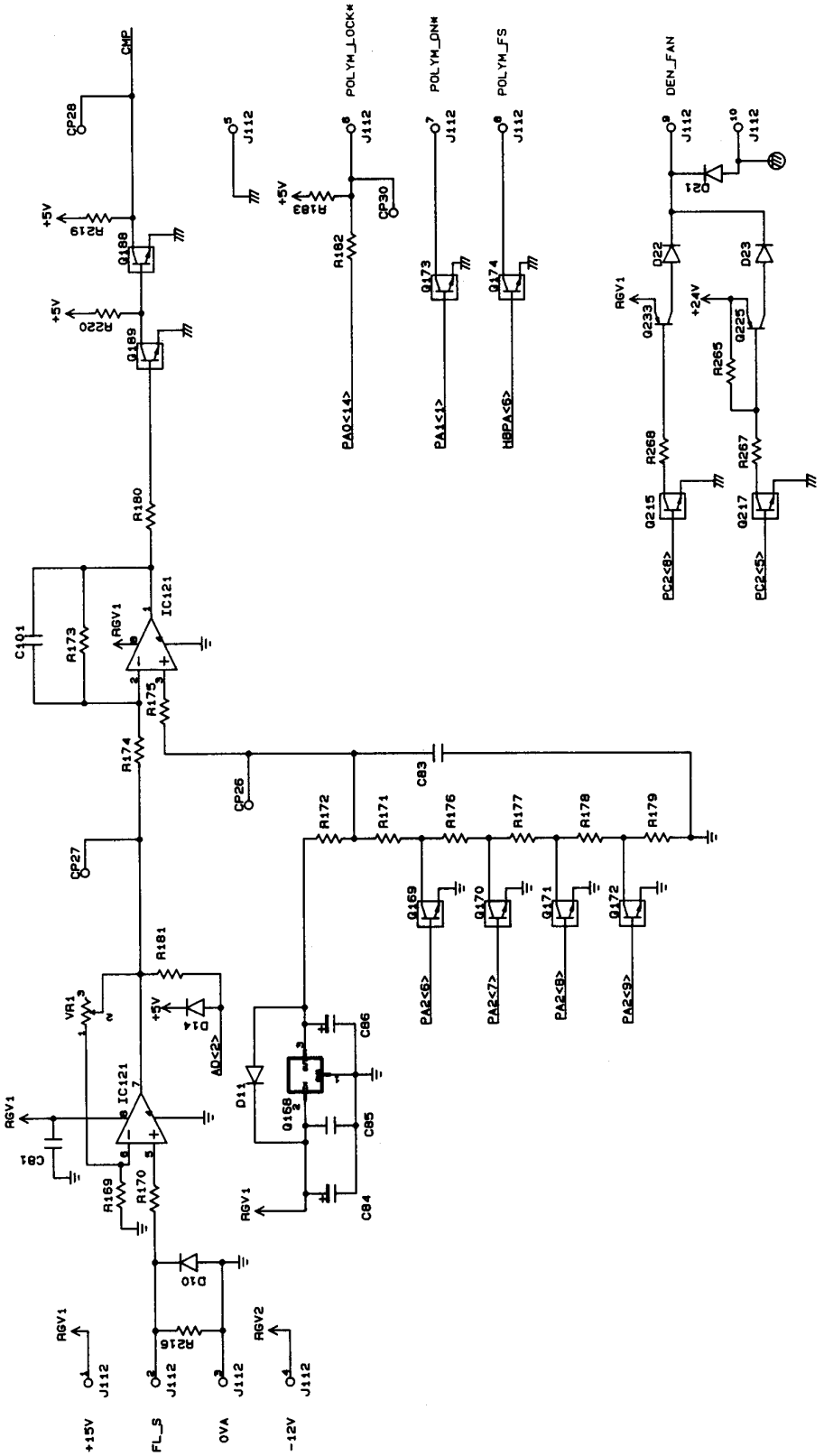
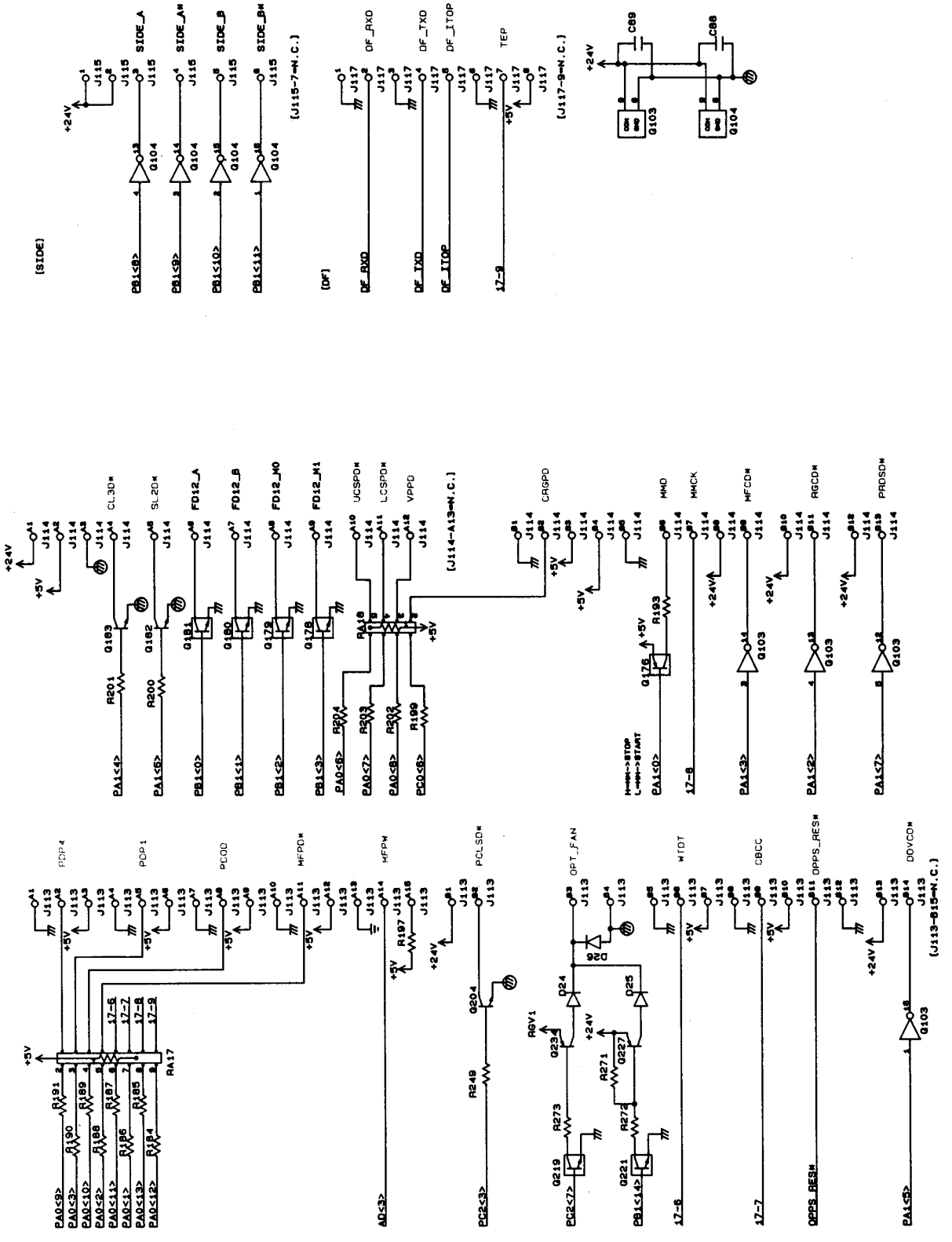
DC Controller Circuit Diagram (11/13)



DC Controller Circuit Diagram (12/13)



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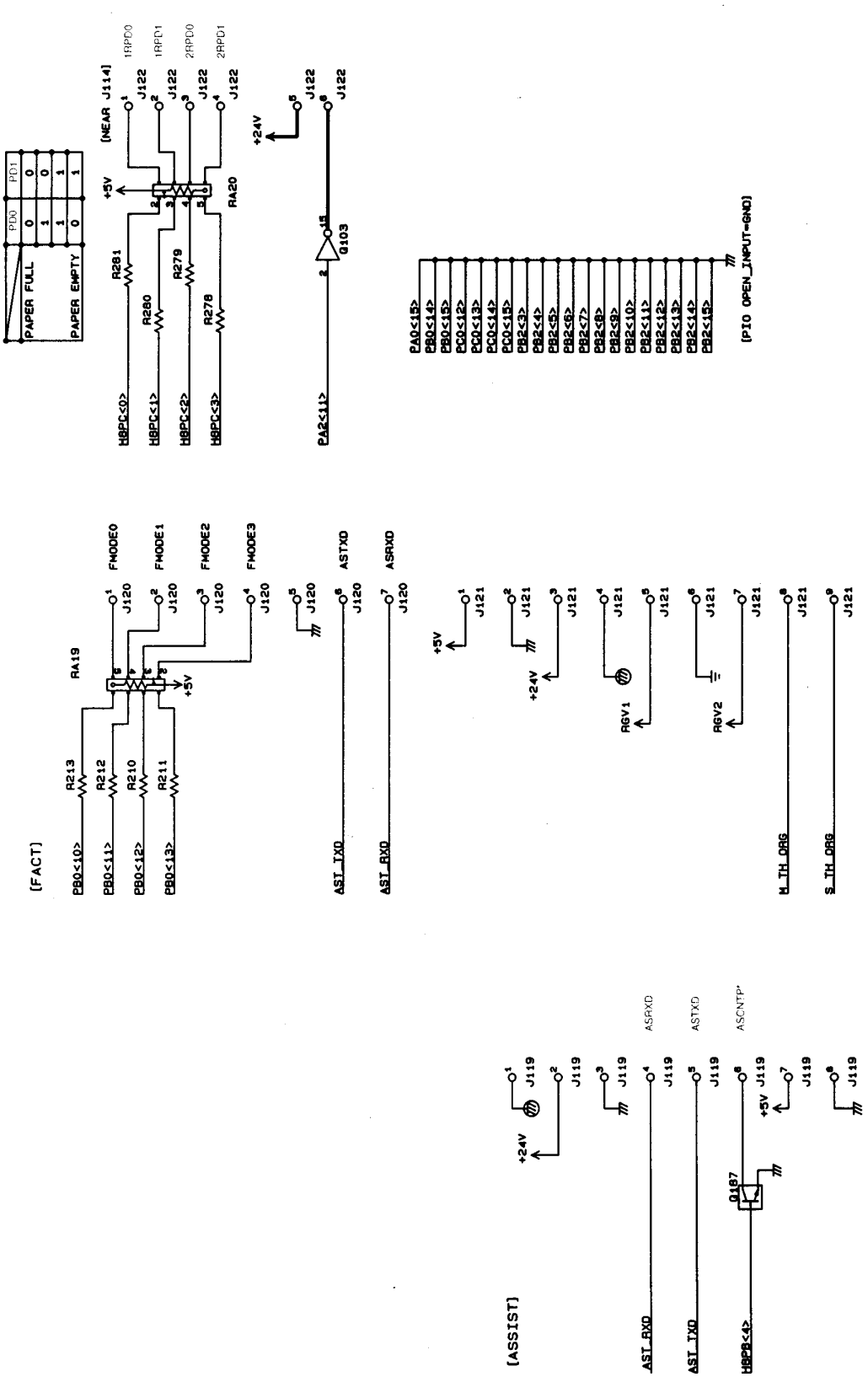
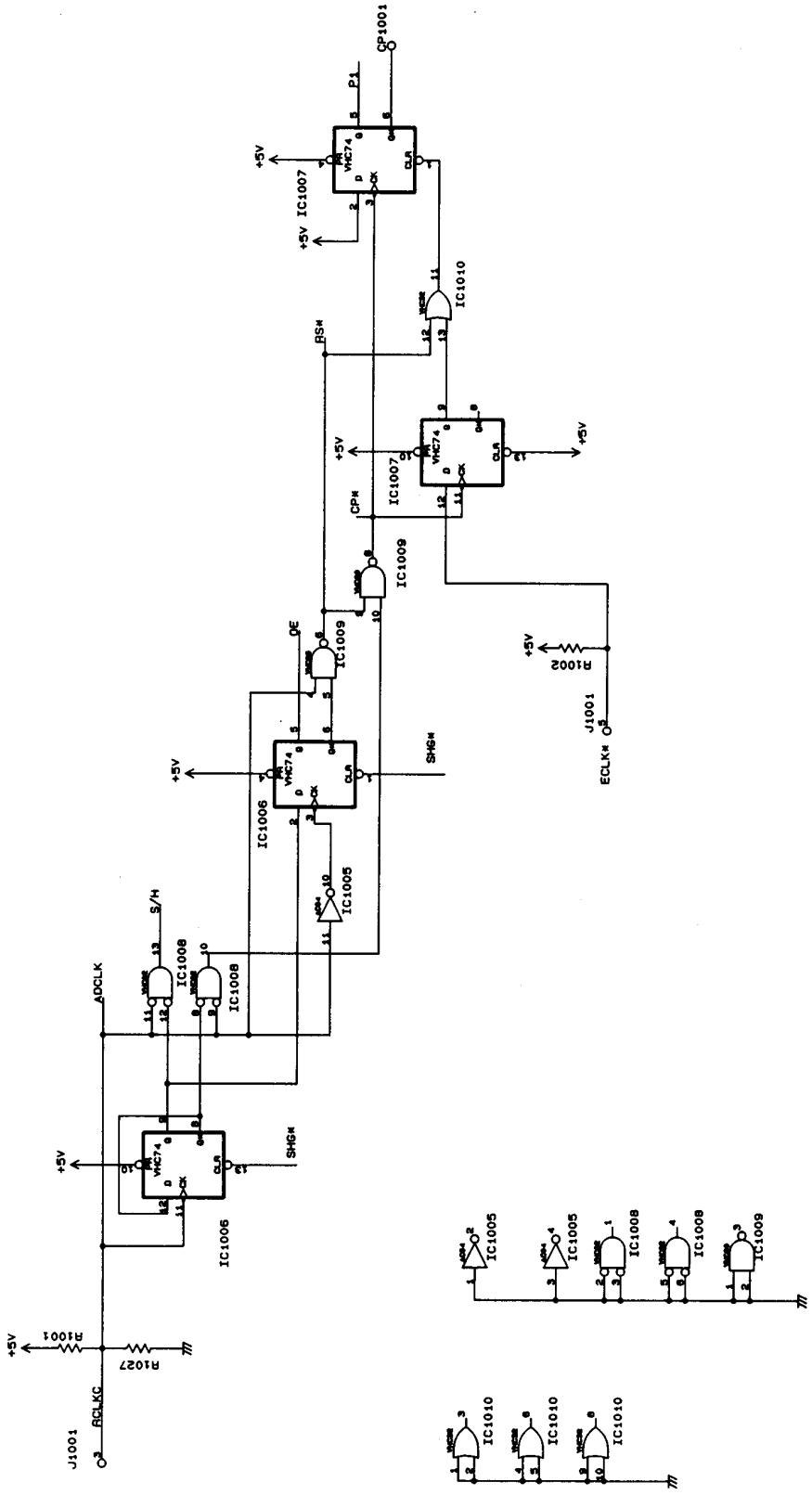
DC Controller Circuit Diagram (13/13)



E. ANALOG PROCESSOR CIRCUIT DIAGRAM

Analog Processor Circuit Diagram (1/4)



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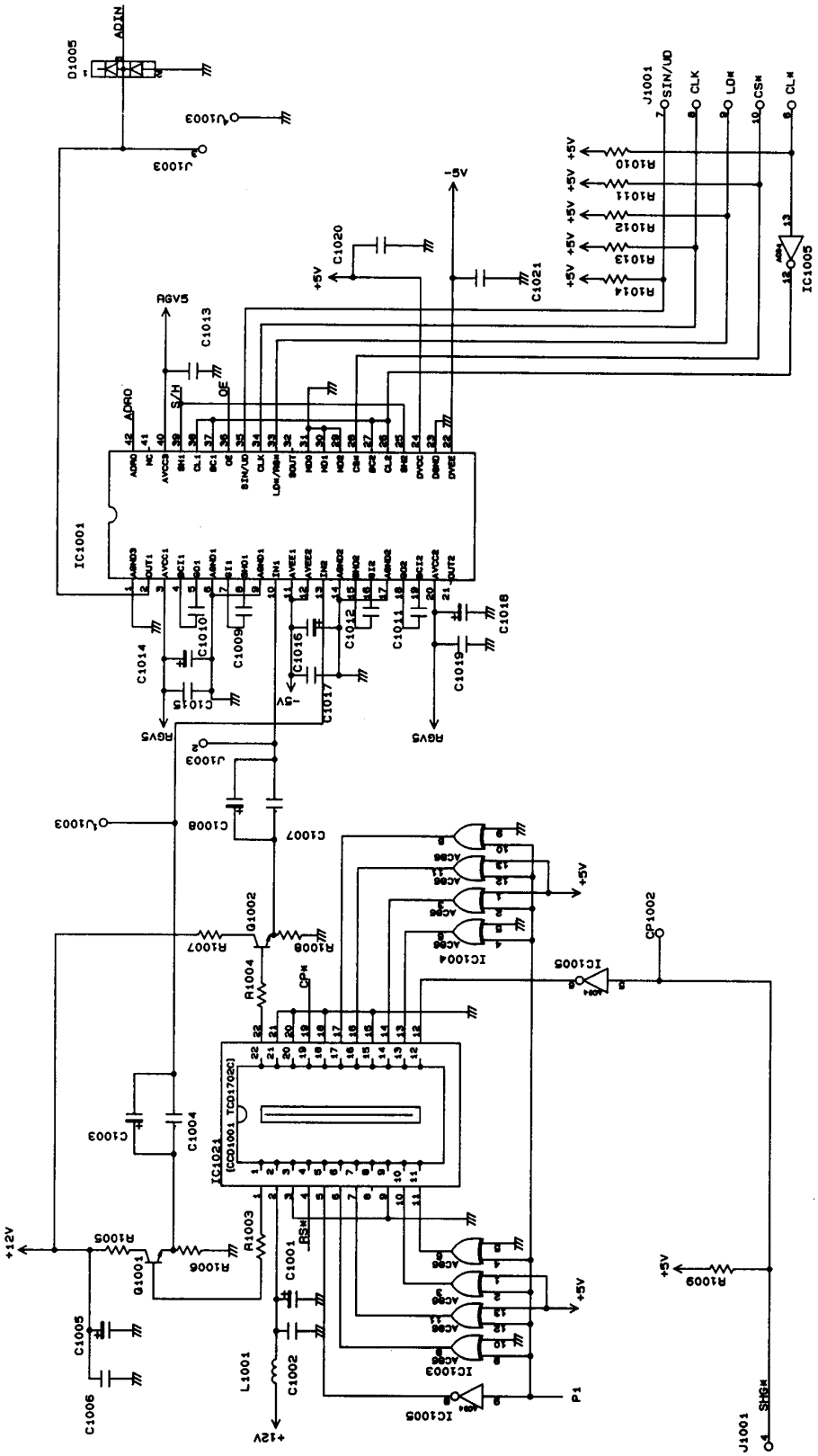
Analog Processor Circuit Diagram (2/4)



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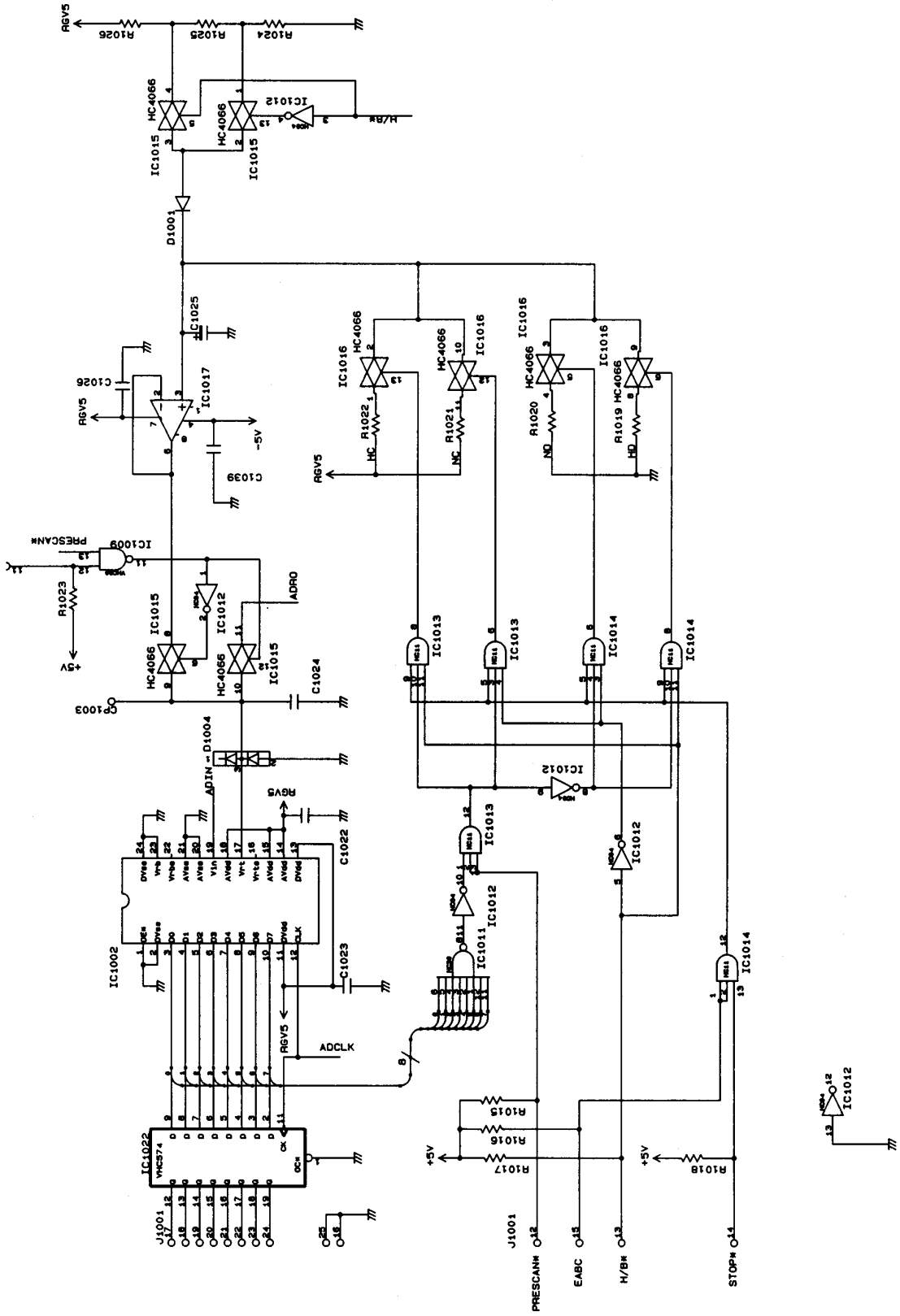
Analog Processor Circuit Diagram (3/4)



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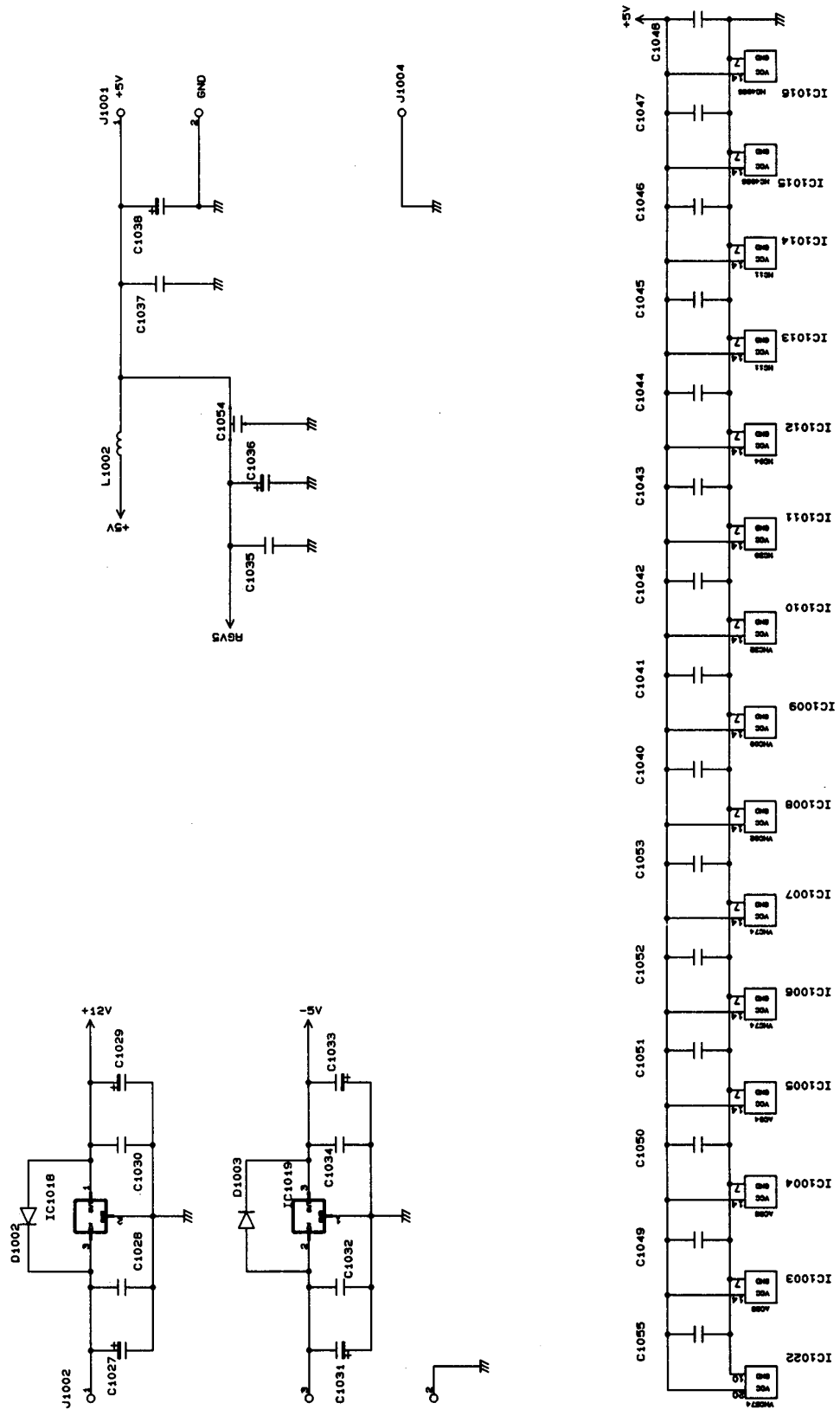
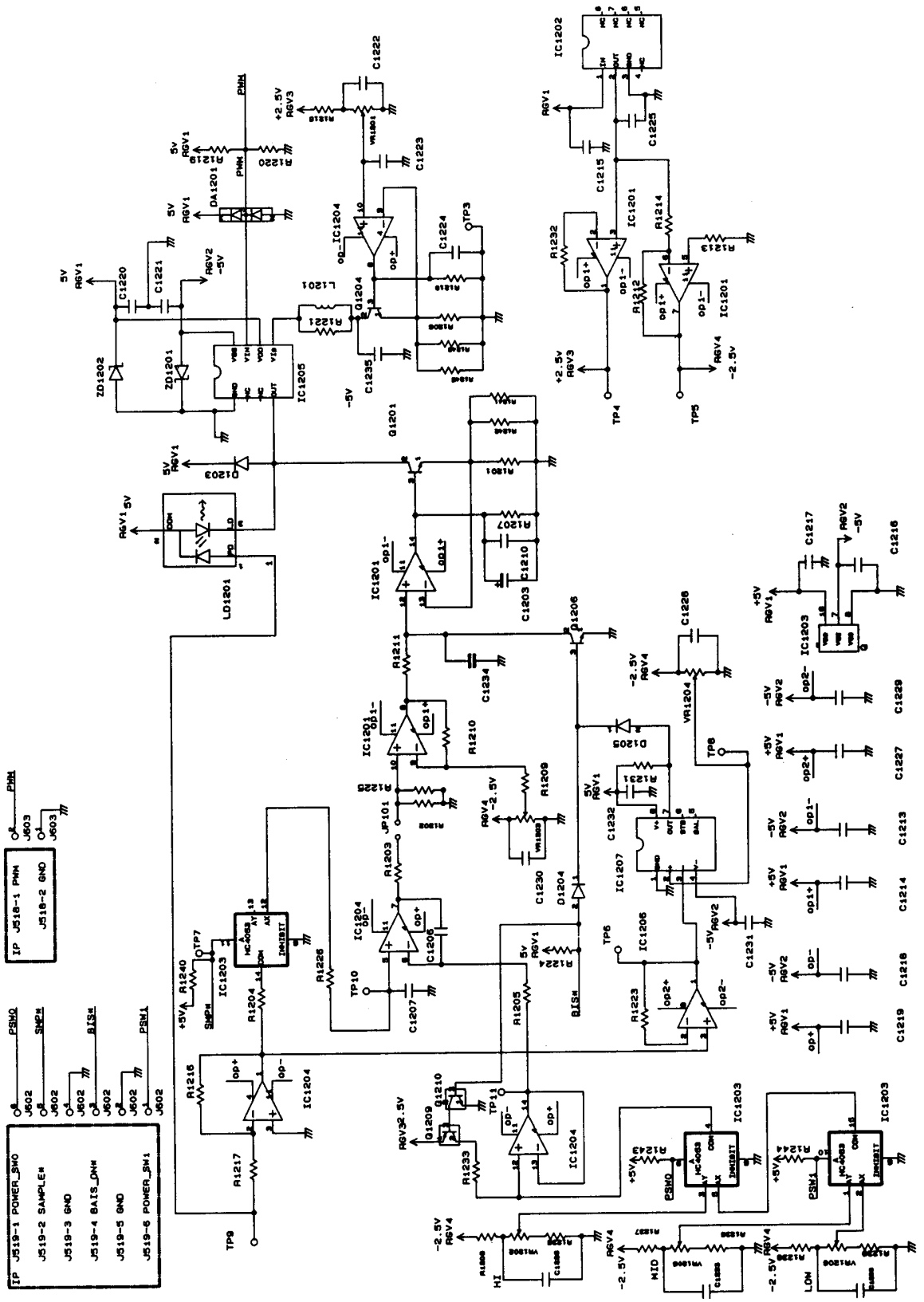
Analog Processor Circuit Diagram (4/4)



F. LASER DRIVER CIRCUIT DIAGRAM

Laser Driver Circuit Diagram (1/2)



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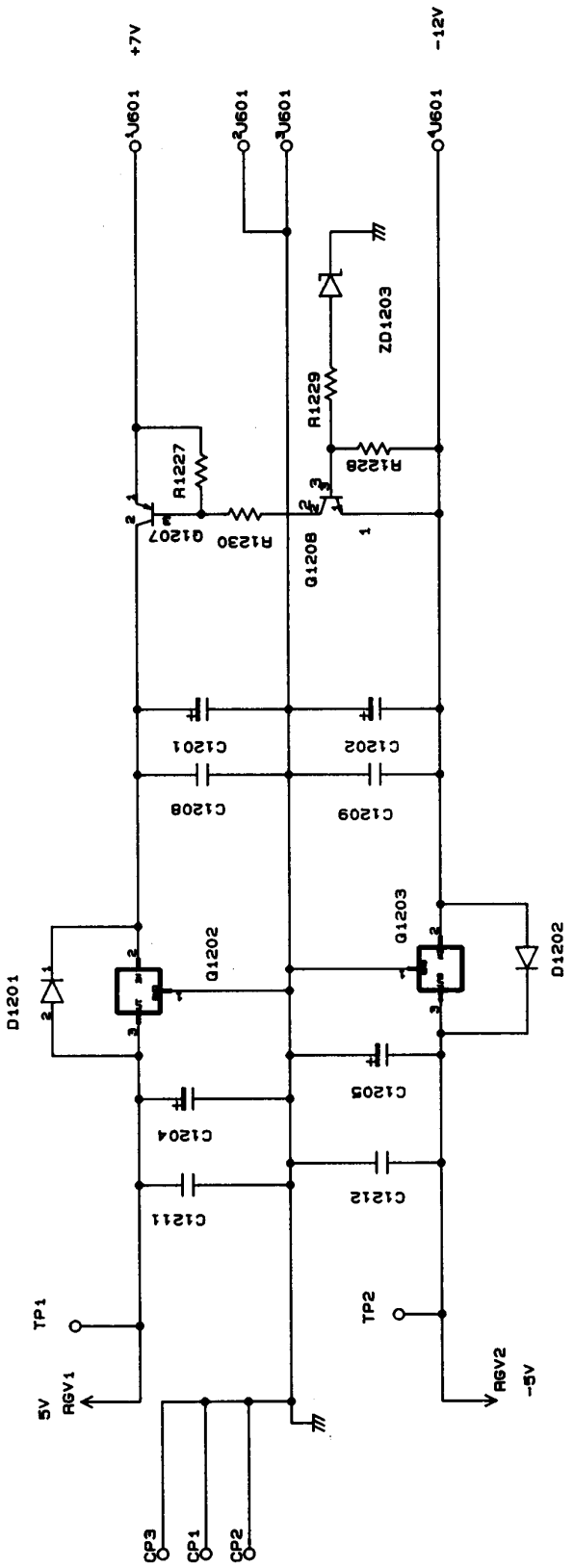
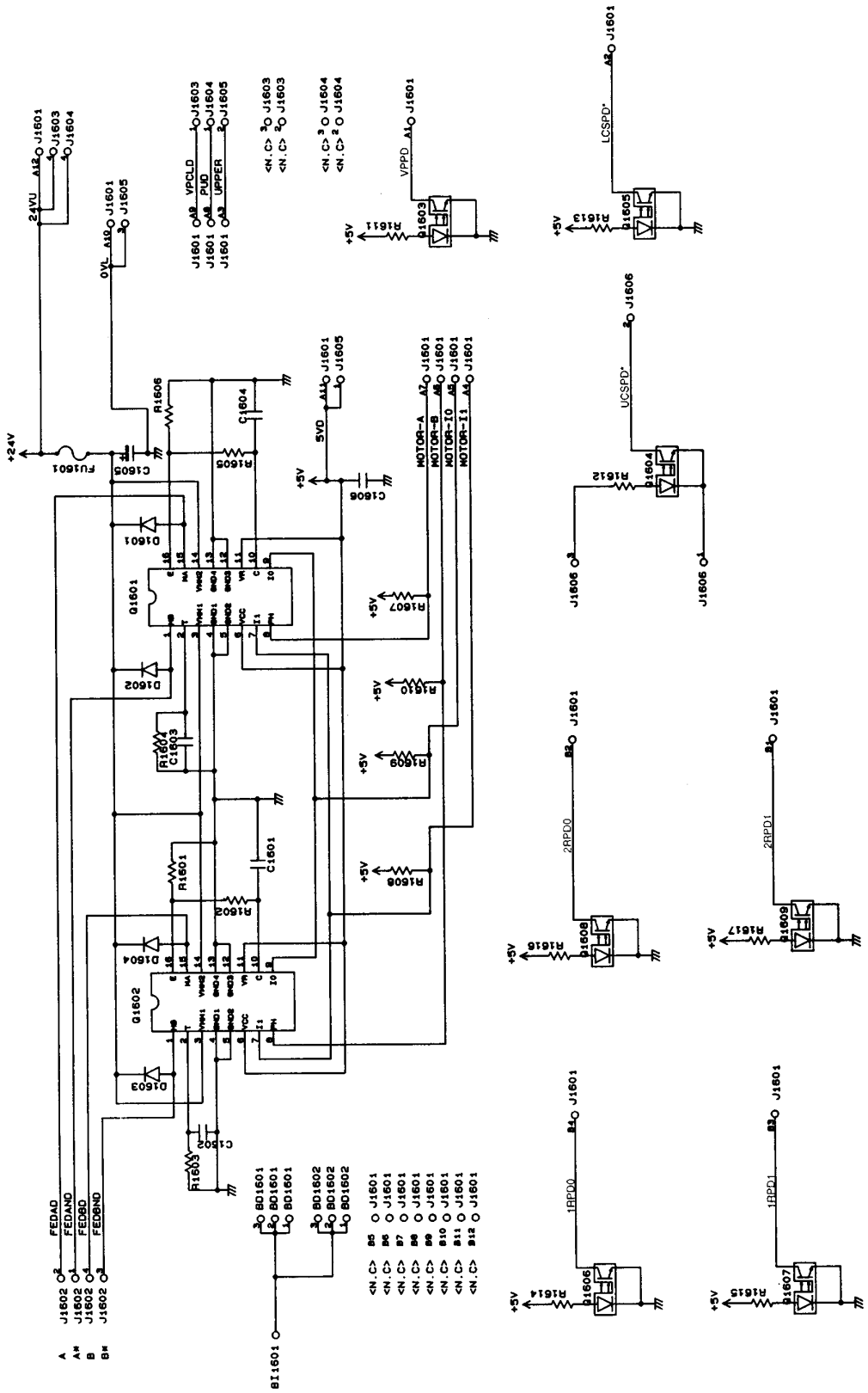
Laser Driver Circuit Diagram (2/2)



G. PICK-UP UNIT CIRCUIT DIAGRAM



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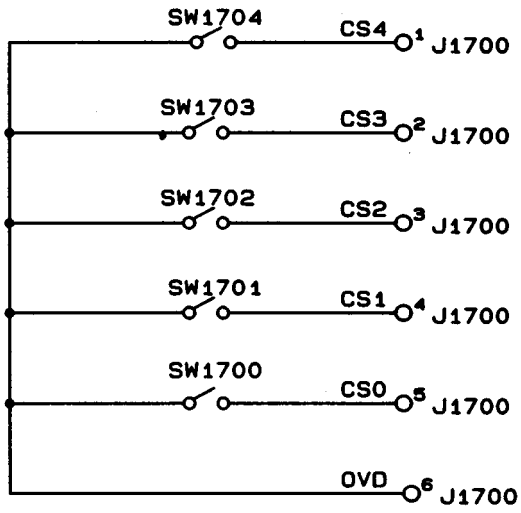
H. CASSETTE SIZE DETECTION CIRCUIT DIAGRAM



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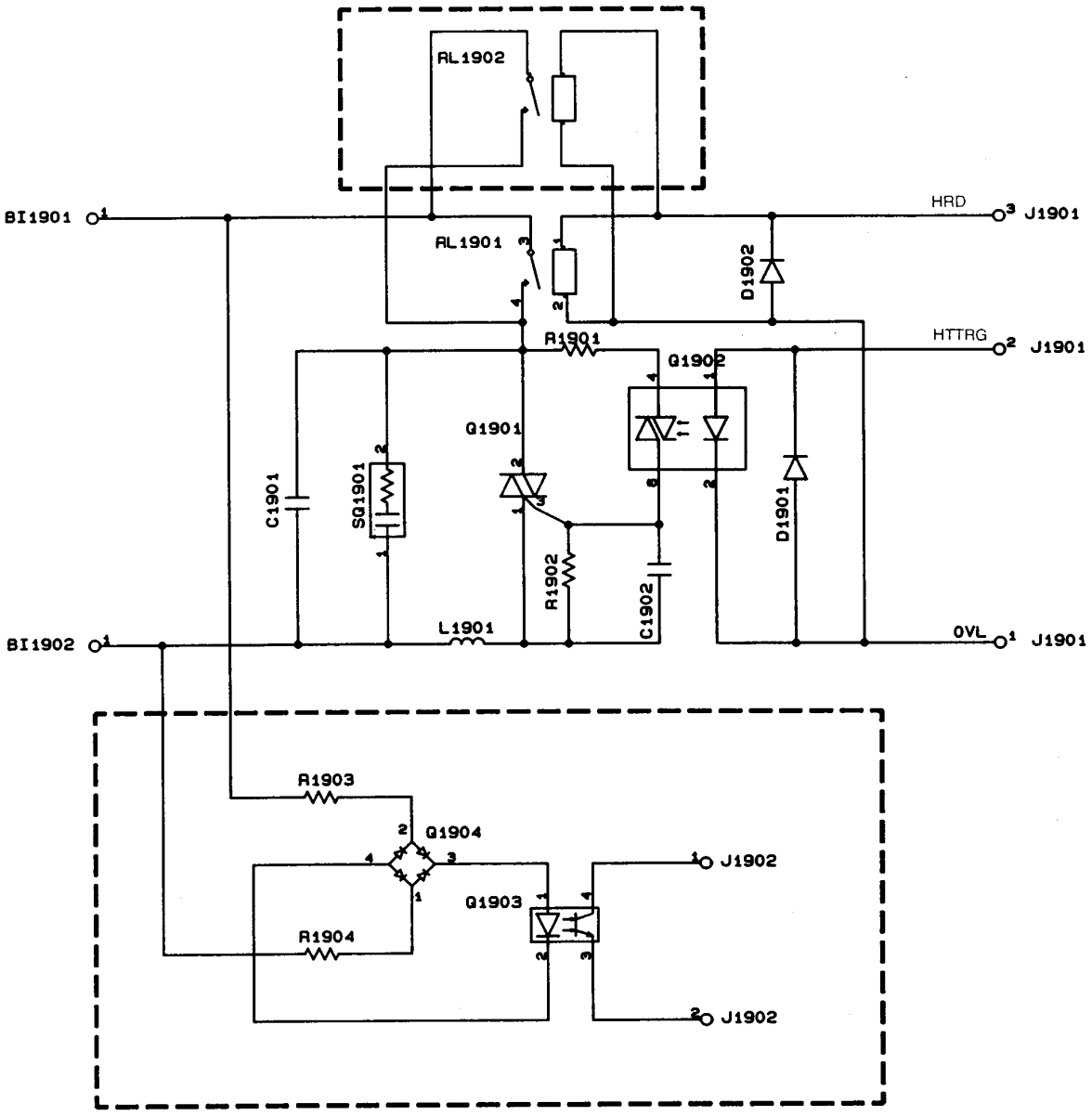
I. FIXING DRIVER CIRCUIT DIAGRAM



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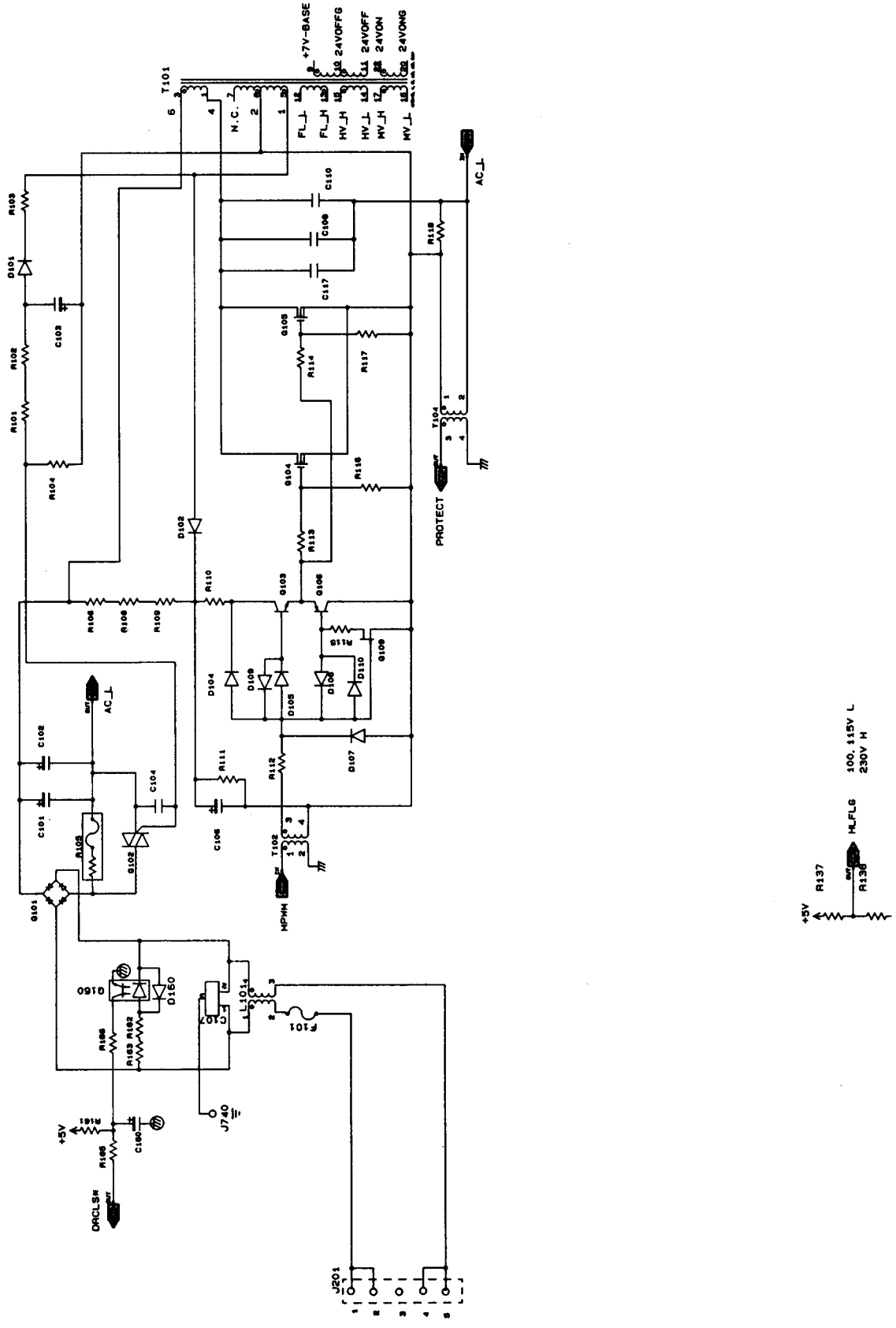
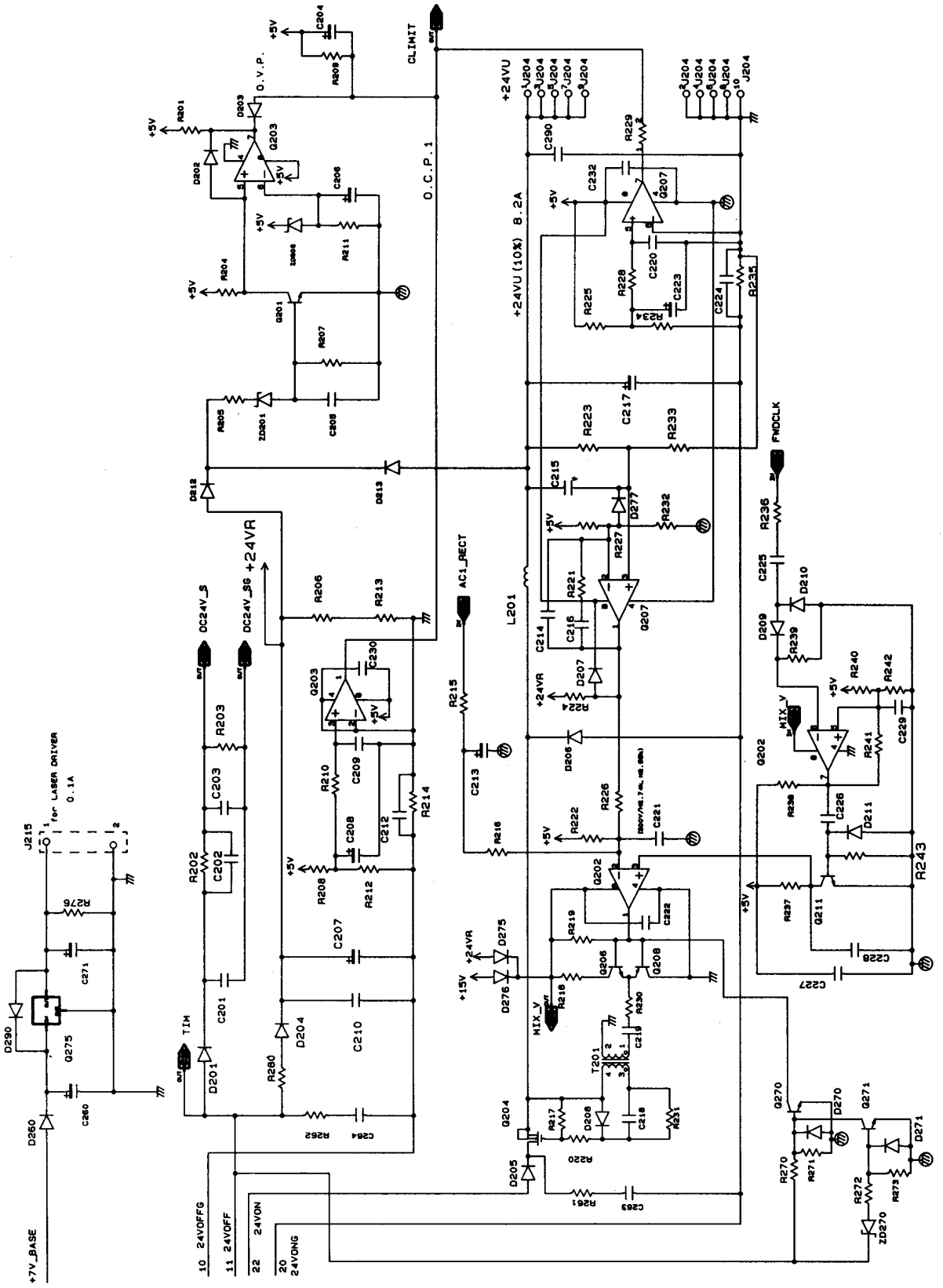
J. COMPOSITE POWER SUPPLY CIRCUIT DIAGRAM

Composite Power Supply Circuit Diagram (1/8)



Composite Power Supply Circuit Diagram (2/8)



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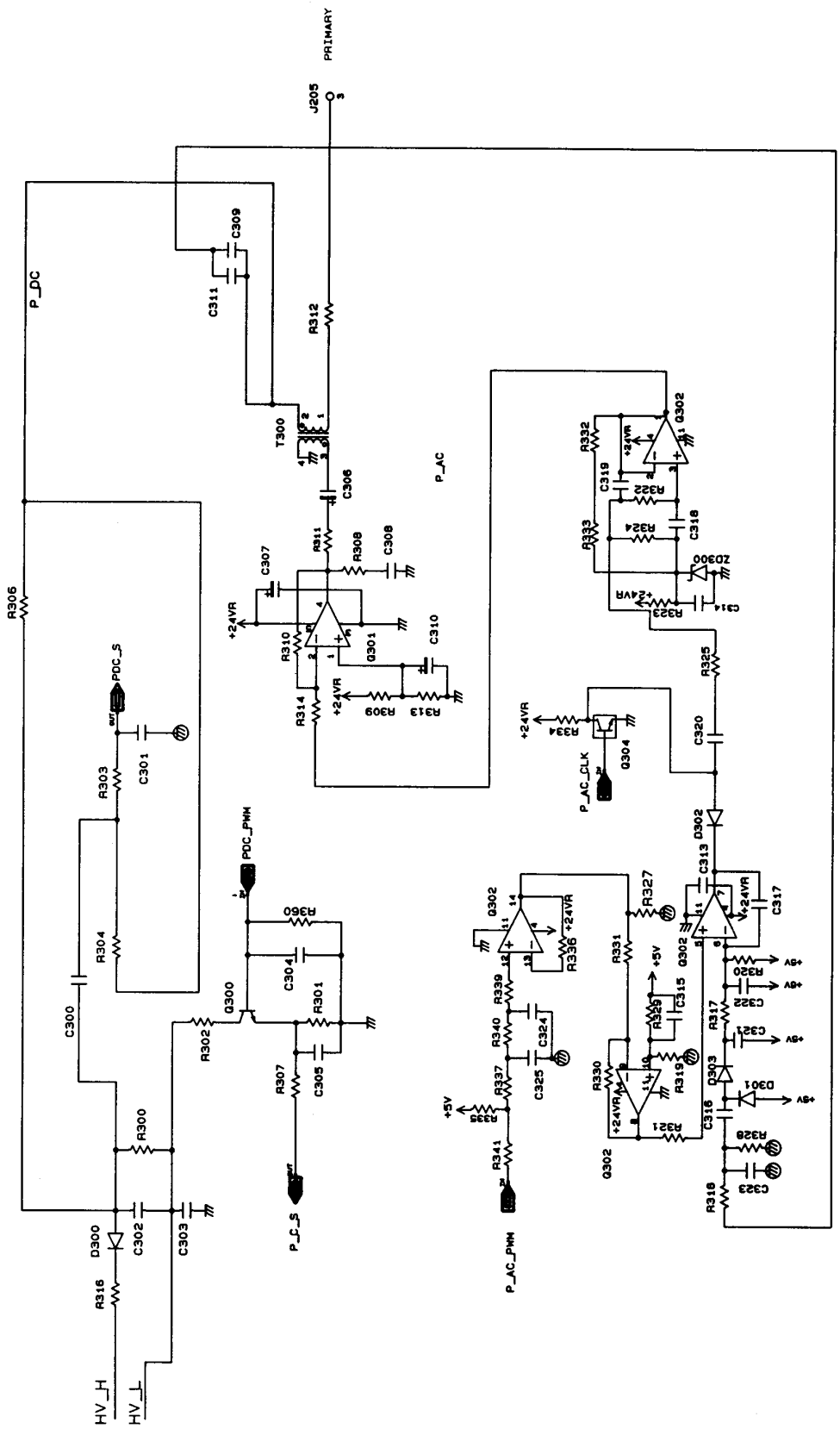
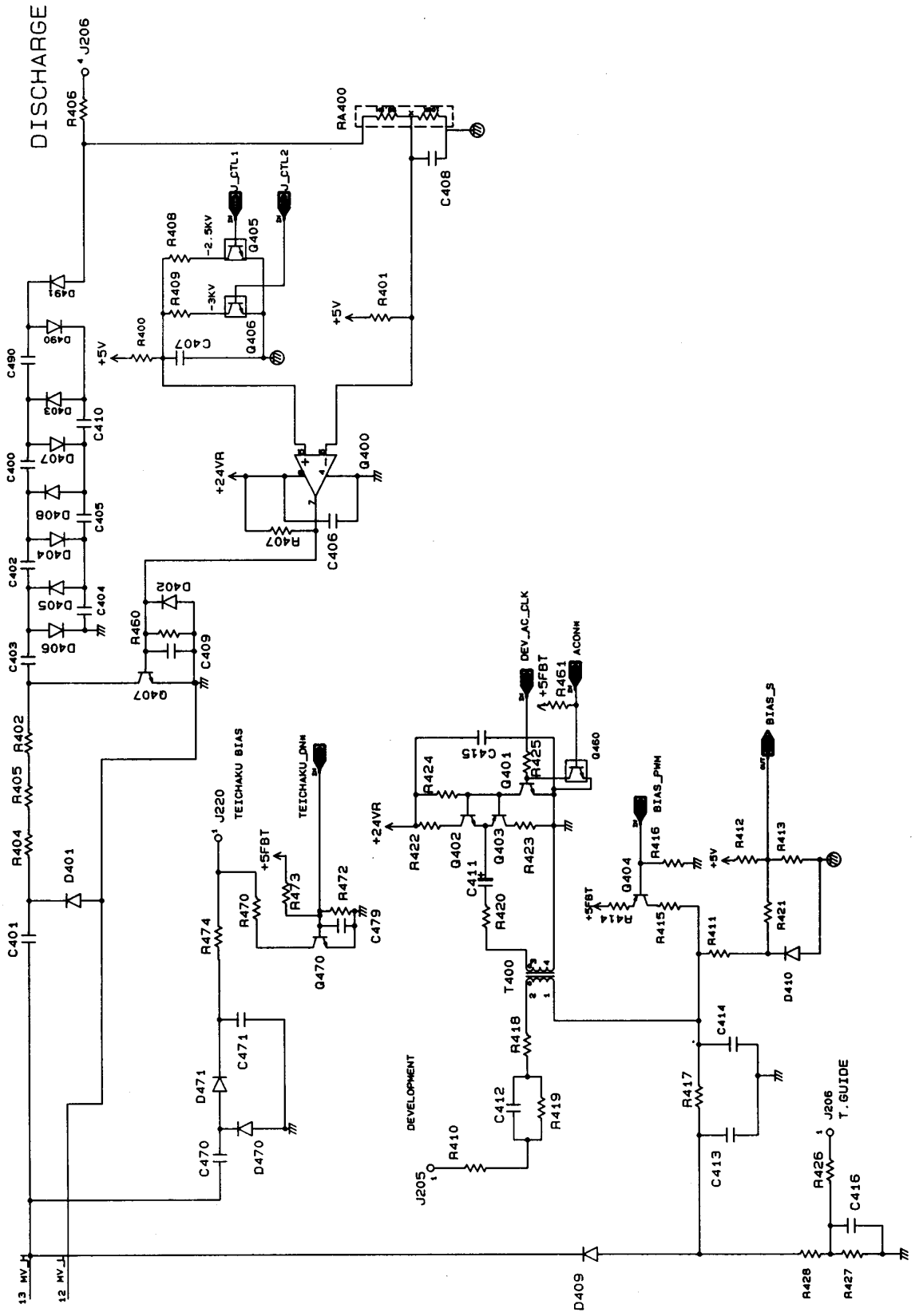
Composite Power Supply Circuit Diagram (3/8)



Composite Power Supply Circuit Diagram (4/8)



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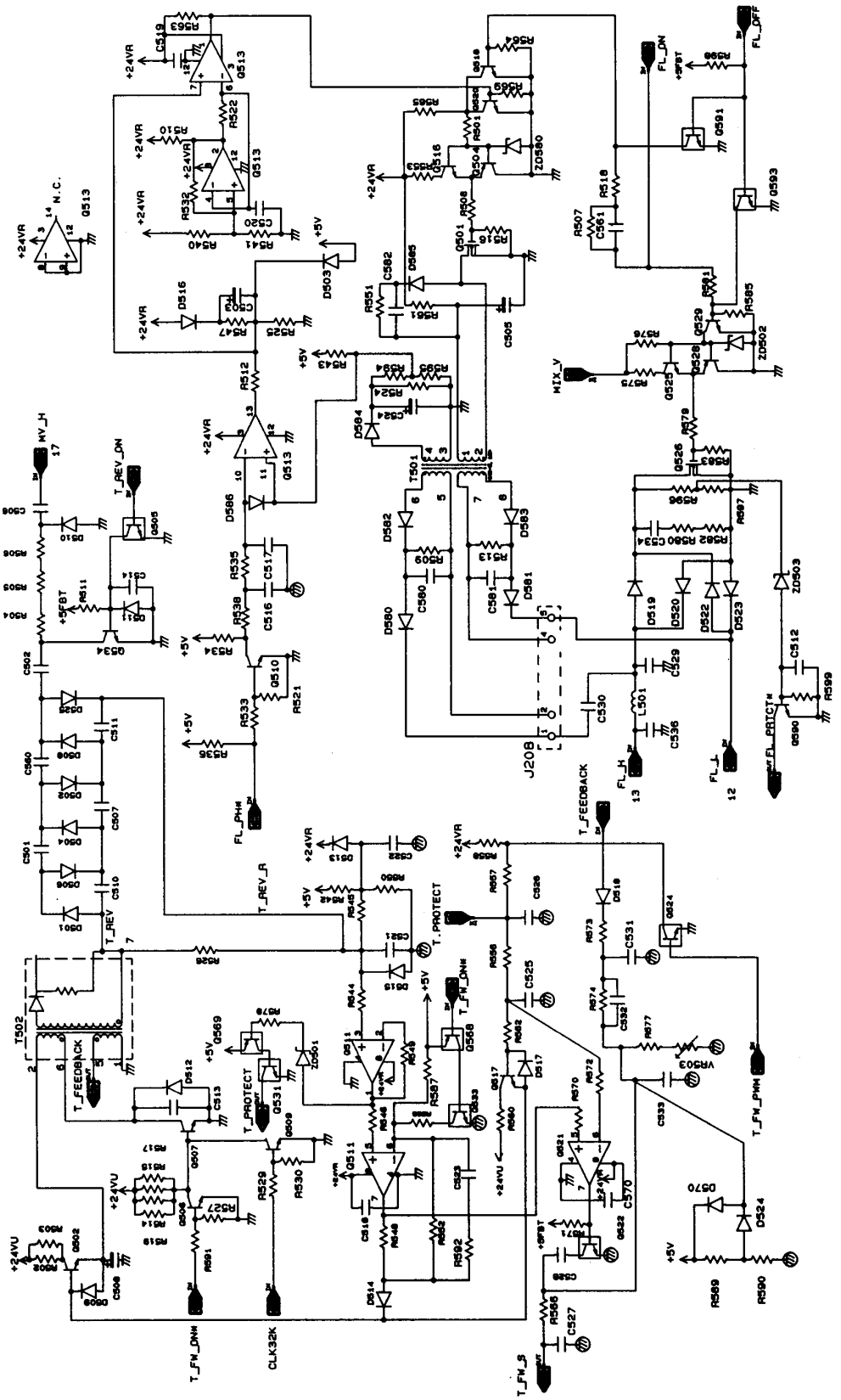
Composite Power Supply Circuit Diagram (5/8)



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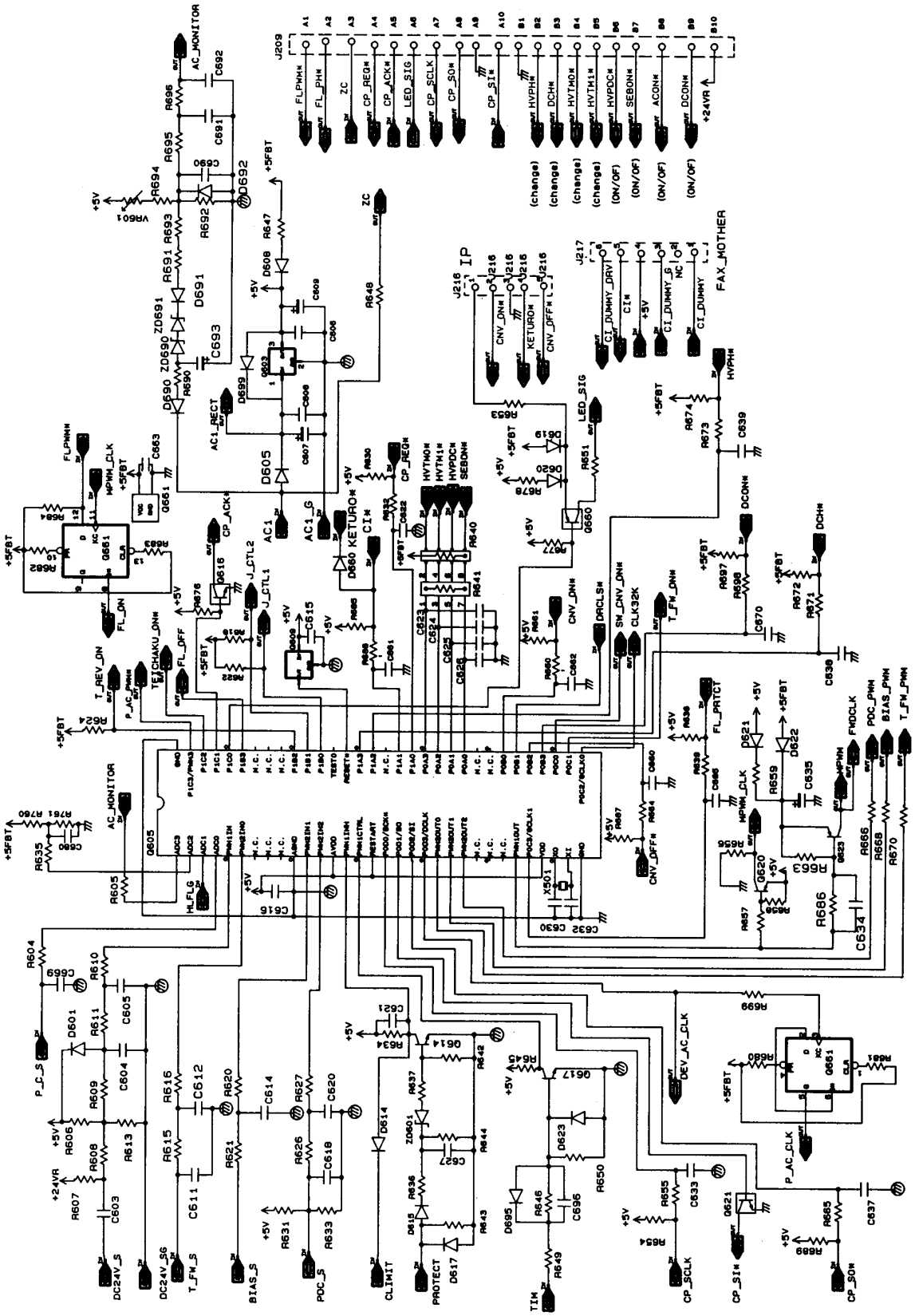
Composite Power Supply Circuit Diagram (6/8)



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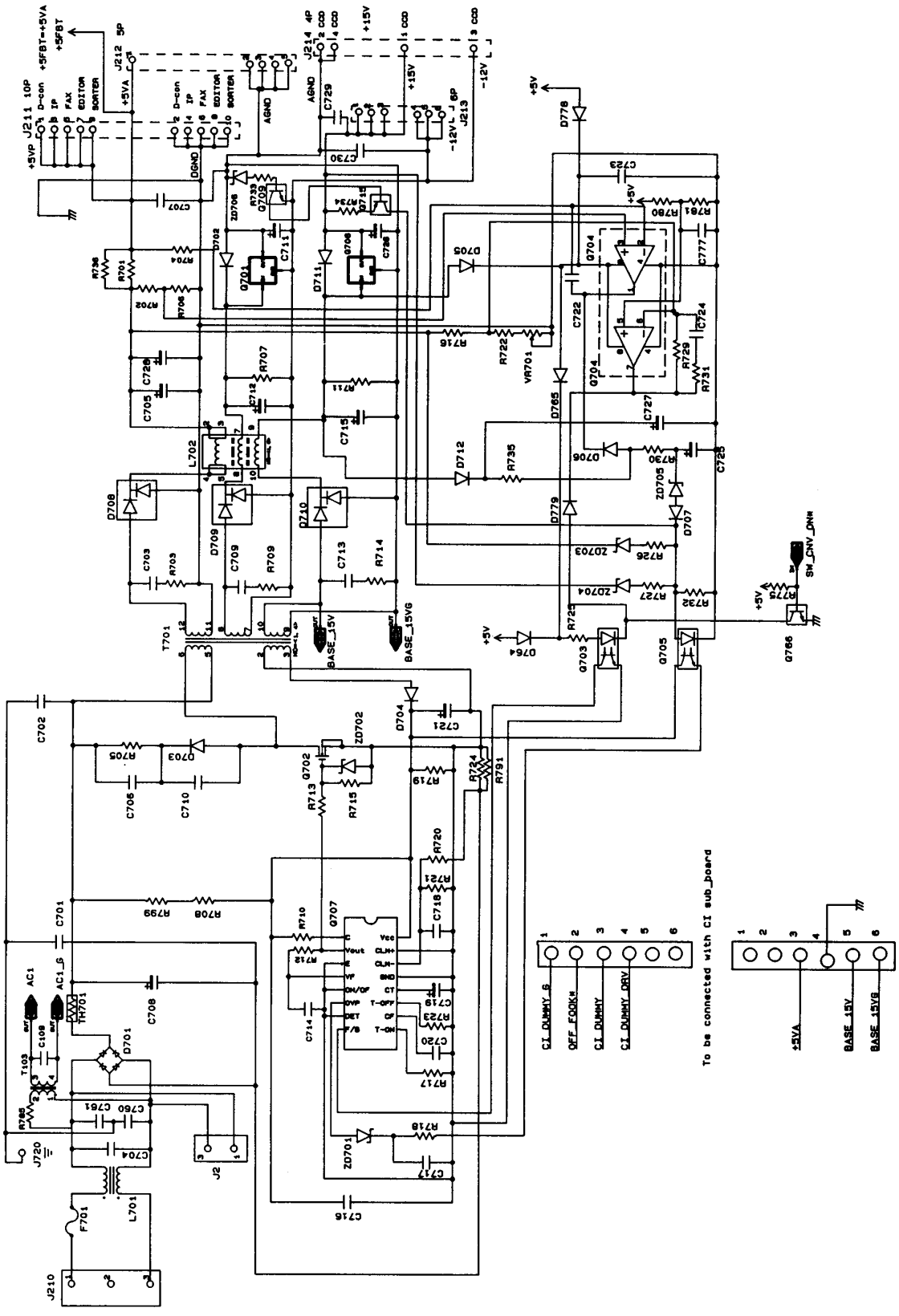
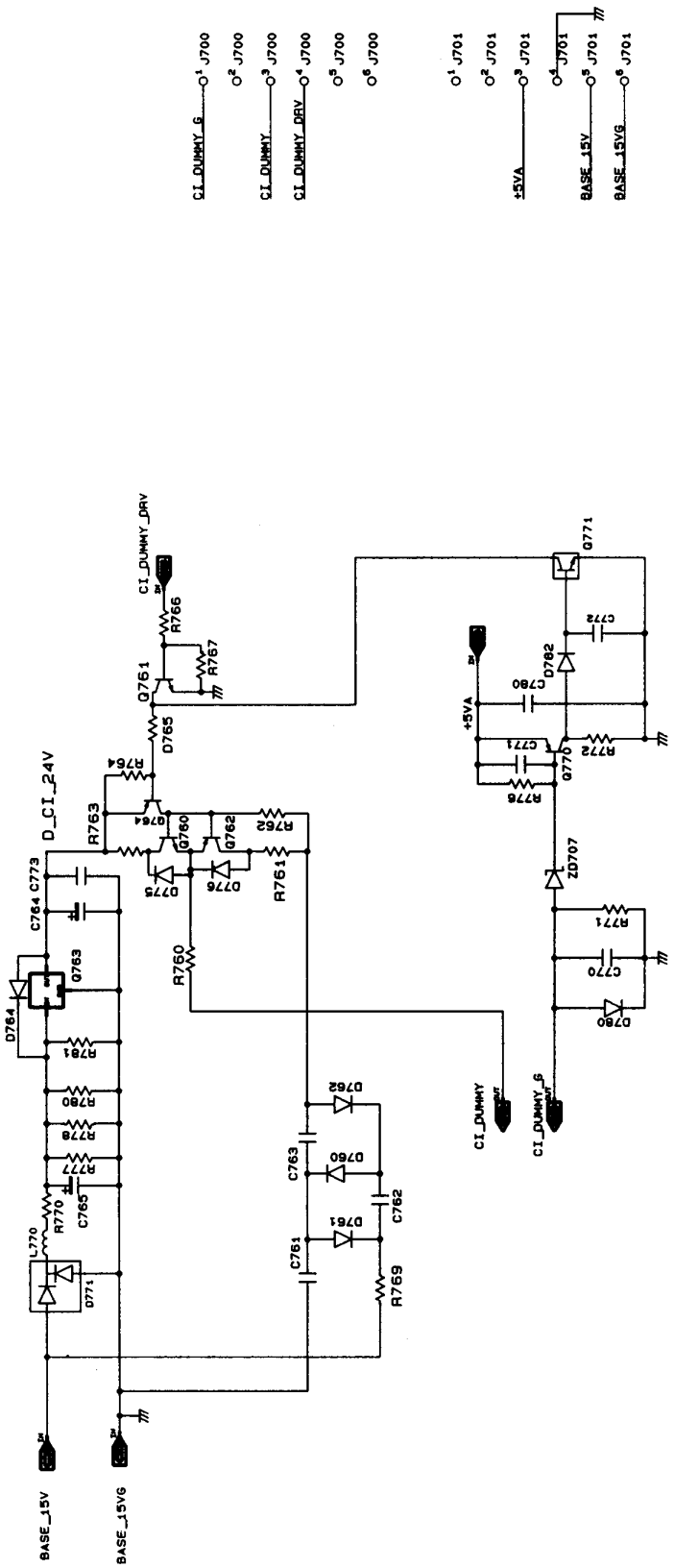
Composite Power Supply Circuit Diagram (7/8)



Composite Power Supply Circuit Diagram (8/8)



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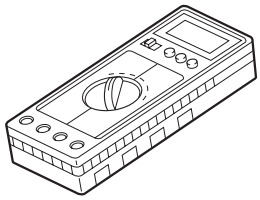
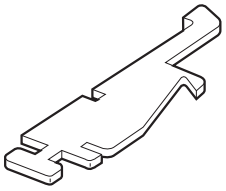
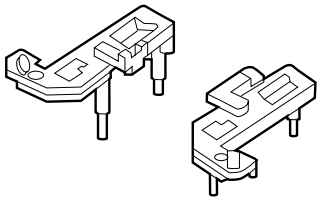
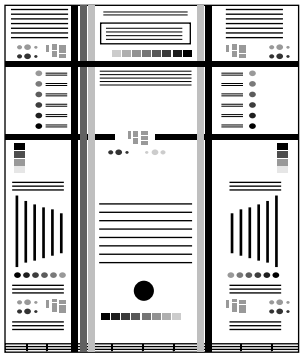
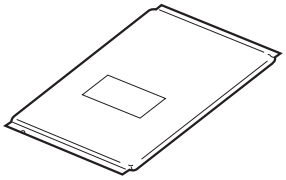
K. LIST OF SPECIAL TOOLS

The following are special tools used to service to copier : use them in addition the standard set of tools.

No.	Tool Name	Tool No.	Shape	Rank	Remarks
1	Digital Multimeter	FY9-2002-000		A	Use it to check the power
2	Door switch actuator	TKN-0093		A	
3	Mirror positioning tool (front, rear)	FY9-3009-040		B	For adjusting the distance between No.1 and No.2 mirror mounts.
4	NA-3 Test sheet	FY9-9196-000		A	use it to adjust/check images.
5	Standard White paper	FY9-3004-000		B	For shading correction (20 sheets/pack)

*Consult the following for a stocking idea.

A : Each service person is expected to carry one.

B : Each group of five service persons is expected to carry one.

C : Each workshop is expected carry one.

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L. SOLVENTS/OILS

No.	Name	Use	Composition	Description
1	Ethl alchol (Ethanol) Isopropyl alchol (Isopropanol)	Cleaning: copyboard glass, mirror, etc.	$C_2 H_5 OH$ $(CHZ_3)_2 CHOH$	• Do not bring near fire. • Procure locally • Isopropyl alcohol may be substituted
2	MEK	Cleaning e.g., metal;oil or toner dirt	$CH_3 \cdot CO \cdot C_2H_5$ Methylethyl ketone	• Do not bring near fire. • Procure locally
3	Heat-resistant grease	Lubricating: fixing drive assemblies	Lithium soap (mineral oil family) Molybdenum bisulfate	Tool No.: CK-0427 (500g can) (Equivqlent grease can be used, but should be able to withstand 200°C for extended periods of time.)
4	Lubricating oil (low viscosity)	Lubricating: Scanner rail, etc.	Mineral oil (paraffin family)	• ISO VG 68 Oil CK-0451 (100cc) • MOBIL Vactraoil NO.2
5	Lubrication oil (low viscosity)	Lubricating: pick-up assembly roller bushing (FS2-1005-000)	Mineral oil (paraffin family)	• ISO VG 220 Oil CK-0524 (100cc)
6	Lubrication oil	Lubricating: drive and friction parts	Silicone oil	Tool No.: CK-0551 (20g)

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